

Marine Review

THE BUSINESS OF TRANSPORTATION BY WATER

NEW YORK

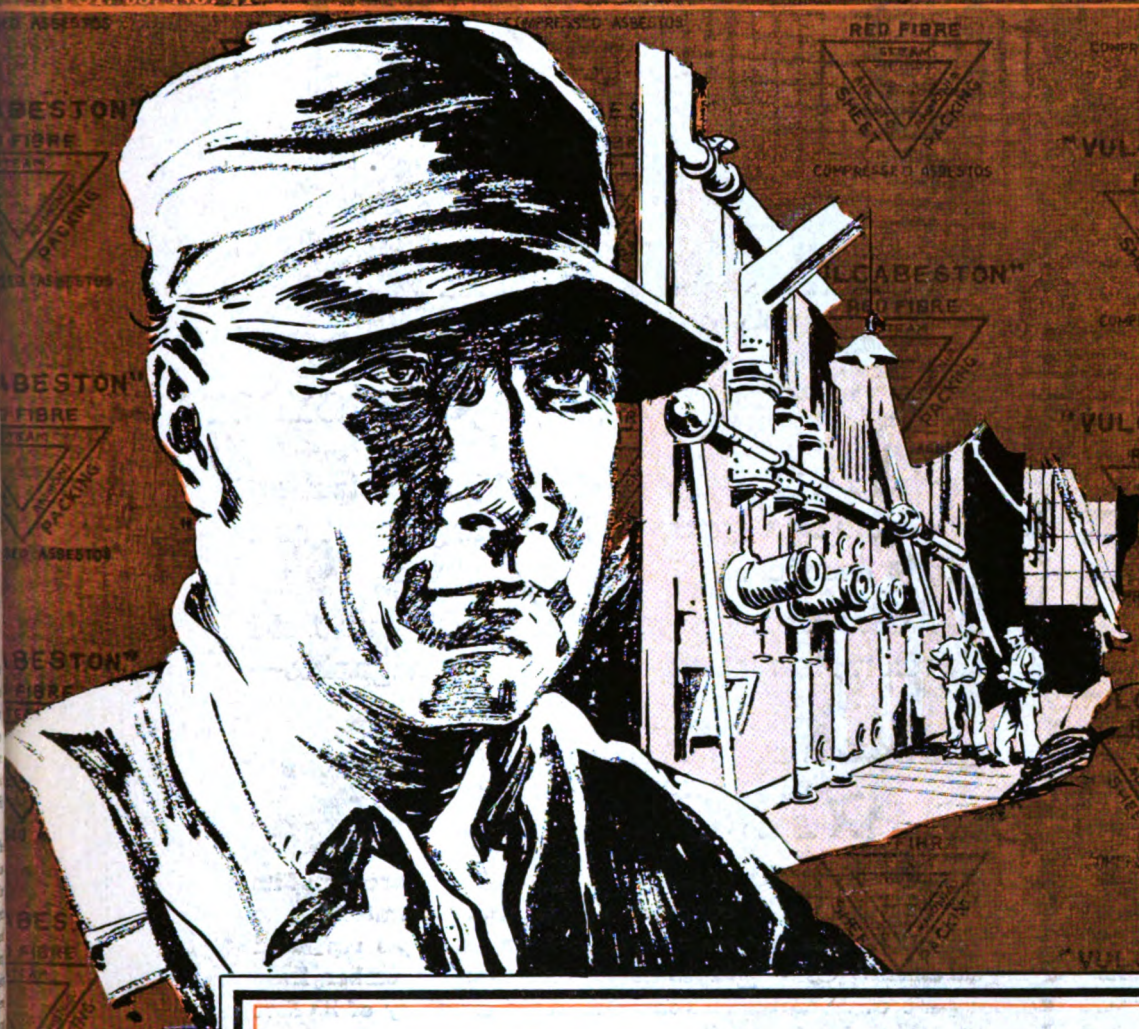
CLEVELAND

LONDON

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*I've used Vulcabeston Packings since
I was an oiler, almost thirty years ago*

"I'VE used VULCABESTON on every job I've held—used it with super-heated steam, saturated steam, hot water, cold water, ammonia, air, gas, oil and alkali—on steam line joints, air lines, oil lines and gas lines; used it on valve bonnets, gas and oil engines, air compressors, ammonia compressors and hot and cold water pumps; used it on pressures up to 1500 lbs., and

at temperatures up to 1000 deg. F. And it always made good.

"I've never found VULCABESTON to bake hard, crack, leak or blow out, and it turns out joints that are as easy to break as they are to make.

"If there is one trick of this trade I want to pass along to the younger men it is—stick to VULCABESTON PACKING and save trouble."

The Johns-Pratt Company
Hartford, Connecticut, U. S. A.



More Linde Service for Linde Customers

The engineering help which the Linde field organization gives to Linde customers has grown to be an important and valuable part of Linde Service.

To augment this personal service rendered by our field organization, Linde offers its customers a monthly magazine—

OXY-ACETYLENE TIPS

This magazine contains well illustrated accounts of new or interesting applications of the process, showing how Linde Service aids in solving customers' problems. It is an integral part of Linde Service, and will be sent free to Linde customers on request.

For over a year, "Oxy-Acetylene Tips" has had a limited circulation as a means

of testing its value. The character of its contents has been well illustrated by the many articles from its pages reprinted in trade papers. The November issue tells in some detail the story of its first year.

Every Linde user should write the nearest Linde District Sales Office, requesting a copy of the November issue.

32 plants and 62 warehouses

THE LINDE AIR PRODUCTS COMPANY

Carbide and Carbon Building, 30 East 42d St., New York City

The Largest Producer of Oxygen in the World

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Seattle
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LINDE OXYGEN

Please mention MARINE REVIEW when writing to Advertisers

American Marine Exhibition
Grand Central Palace, New York
November 5-10, 1923
Marine Review
Cleveland Ohio



Exhibits Reveal Engineering Progress in

AJAX ROPE CO., INC., 149 Broadway, New York—This exhibit is to be entirely of a marine nature. The following will be in attendance: R. S. O. Lawson, vice president and general manager; Milton L. Chapman, general sales manager; Chester Woodnorth, assistant manager together with the following representatives of the eastern sales force: John White, Milton Mintzer, Russell Robb and Benjamin C. Hill. Norman Rounds will represent the export department.

AKIMOFF PROPELLER CO., Harrison building, Philadelphia—Diagrams, photographs and models of propellers, all built upon the "circulation" theory, will be shown. Representatives will be N. W. Akimoff and Dr. S. E. Slocum.

AMERICAN CAR & FOUNDRY CO., 165 Broadway, New York—The exhibit includes a 2-electrode electric rivet heater, with hood; a 3-electrode electric rivet heater and a 1-electrode electric end-rod heater. F. C. Cheston, W. M. Earl and D. B. Wallace will be in attendance at the booth.

AMERICAN STEEL FOUNDRIES, McCormick building, Chicago—Anchors and their construction and use will be featured. The exhibit probably will be in charge of K. L. Ames Jr.

ASHTON VALVE CO., 161-179 First street, Cambridge, Boston, Mass.—This exhibit will show main boiler pop safety valves, as well as smaller pop safety valves and relief valves, also pressure and vacuum gages, gage and boiler testing outfits, and large size marine whistles. In charge of Charles W. Buckelew, C. W. Ulrick and C. D. Motheral.

BABCOCK & WILCOX CO., 85 Liberty street, New York—The company will show the following equipment: Full size sectional model of the 4-inch tube boiler; various boiler valves and fittings; sections of boiler headers; working exhibit of the concentration salinity indicator; full size model of various Babcock & Wilcox design oil burners, among which will be the latest type oil burner, known as the Mayflower. The new boiler water testing outfit which will include a test for alkalinity, will be shown. Represented by C. W. Middleton, J. H. King, George H. Daniels, John Coleman, A. Ross Mackay, James Graham, Edward A. Colson.

BETHLEHEM SHIPBUILDING CORP., LTD., Bethlehem, Pa.—This company will exhibit two or three of its marine feed pumps, Bethlehem-Weir type, both reciprocating and turbine driven. At least one of these pumps will be in operation. Oil-burning equipment, showing a complete system, a combined pump and heater set and a burner in actual operation, will be shown as well as a new direction indicator used in connection with engine room telegraphs. Representatives will include A. W. Christian, general sales agent; G. A. Richardson, manager publicity; G. E. Lawrence, G. W. Grove and F. K. Steinrock.

BRIGGS ENGINEERING CO., INC., 219-227 Twenty-fourth street, Brooklyn, N. Y.—Oil-firing equipment manufactured by this company will be displayed. Representatives will be William E. Yandell, president; Clarence N. Wheeler, vice president and treasurer; Harry M. Kuppinger, chief engineer, and Hamilton B. Patterson, secretary.

BROWN INSTRUMENT CO., Philadelphia—The exhibit will include pyrometers both indicating and recording, recording thermometers and pressure gages, draft gages, resistance thermometers, automatic temperature control and automatic signaling equipment, salinity meters for boiler feed and evaporator measurements, electric carbon dioxide recorders and electric

tachometers both indicating and recording. Representatives are G. W. Keller, sales manager; A. E. Keller, research manager; J. D. Andrews, New York district manager; E. Schneider, research department; C. L. Simon, technical director of advertising, and M. M. Watkins, special representative.

BURMEISTER & WAIN, LTD., Copenhagen, Denmark, and 27 Whitehall street, New York—Representatives will be S. M. Petersen, R. L. Larsen and H. C. Hallings.

COEN CO., INC., 50 Church street, New York—This company will exhibit a complete oil burning system, piped up to show the different component parts ready for operation. Particular attention will be directed to its new design of swing type air register firing front and burner set, also to the fuel oil heater. The latest design burner with self-seating holder will be shown as well as fuel oil strainers and strainers especially adapted to diesel engine work. Those in charge will be W. M. Wampler, G. H. Ord, H. B. Chamberlain, F. S. Harper, F. Hall.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., Richmond and Norris streets, Philadelphia—The exhibit will include a diesel engine, marine steam turbine, reduction gear and bronze castings. Those in charge will be W. P. Smith, C. D. Cramp, C. R. Peterson and J. C. Shaw.

CRANE PACKING CO., 53 Park place, New York—This exhibit will consist of a model condenser on which a continuous test will be made. The model is so designed that the tubes may be driven back and forth through the packing while subject to hydrostatic pressure, showing that the tubes are free to elongate and are not deformed. The line of packing for general marine work will be on display. Representatives will be Julian N. Walton, east-

ern manager; E. M. Roberts, marine representative, and Colby W. Bryden, industrial representative.

DIAMOND POWER SPECIALTY CO., Detroit—The exhibit will show a rear end soot blower for Scotch marine boilers, rear end front operated boiler for Scotch marine boilers, revolving soot blower for marine watertube boilers, valve-in-head soot blowers for marine watertube boilers, soot blowers for watertube boilers. Representatives will be L. W. Nones, eastern marine manager, and Robert June, Detroit.

DIEHL MFG. CO., Elizabeth, N. J.—The apparatus in this exhibit includes an enclosed, watertight, ball bearing, circulating pump motor, for submarines of the United States navy, with the armature showing special construction to withstand high speeds and special insulation for warm temperatures; two ventilation blowers with enclosed, waterproof motors, for the REPUBLIC (ex BUCHANAN); marine type motor of the enclosed-ventilated type; small portable ball bearing ventilation blower; gyrating ceiling fan for use in dining rooms and large spaces; bucket blade exhaust fan with watertight, ball bearing motor, for bulkhead mounting; electric desk and bracket fans for staterooms; sewing machine driven by motor for sailmakers. Those in charge are M. W. Buchanan, J. R. Marvin, W. E. Fey and J. G. Levy.

O. M. EDWARDS CO., INC., Syracuse, N. Y.—This company will exhibit a marine sash balance for balancing large heavy glass or sash commonly used on promenade decks of ocean liners. This device is made of brass and bronze. A sill locking mechanism is furnished. J. J. Edwards and A. J. Horgan will be in attendance.

ELECTRO SUN CO., INC., New York—This exhibit will include such phases of the blue and black printing and photoprinting industry as will interest the marine man. A. L. Weil is in charge.

L. W. FERDINAND & CO., 152 Kneeland street, Boston.—The company will exhibit marine glue, linoleum and tile cements. The exhibit will be in charge of August Schlueter.

GENERAL CARBONIC CO., 542 Fifth avenue, New York—This exhibit will emphasize the importance of both purity and dryness of carbon dioxide gas used as a refrigerant. A battery of cylinders containing CO₂ gas so connected with a fire detector as to demonstrate the effectiveness of carbonic gas as a fire extinguisher aboard vessels will be shown. The following will be at the booth: Alex McKinny, Harry R. Minor and Charles H. Wardell.

GENERAL ELECTRIC CO., Schenectady, N. Y.—A comprehensive exhibit of marine apparatus of especial interest to marine engineers, architects, shipbuilders, owners and others will be prepared. The outstanding features which will be shown are a 10-kilowatt, steam engine driven generating set with switchboard; two 18-inch searchlights; a direct current motor with control; a motor driven air compressor; a 32-volt, 500-watt turbine-generator set and a watertight controller. Various charts will also be on display.

GRISCOM-RUSSELL CO., 90 West street, New York—This exhibit will include representative examples of the company's entire line of marine auxiliaries. The principal units on exhibition will be: A submerged type, self-scaling evaporator with complete fittings; feed water heaters assembled with complete fittings in both the single and two-pass types, multiscreen filter and grease extractor of the pressure type, and a large multiwhirl oil cooler. Representatives

Main Floor Exhibitors

	Booth Number
Ajax Rope Co.....	56
Akimoff Propeller Co.....	1/2 67
American Brass Co.....	90
Ashton Valve Co.....	19 and 1/2 18
American Car & Foundry Co.....	1/2 85
Asbestolith Mfg. Co.....	97
Babcock & Wilcox Co.....	76-77
Babcock & Wilcox Tube Co.....	88
Bethlehem Shipbuilding Corp.....	68
Beaver Tile, Inc.....	11
Brown Instrument Co.....	1/2 65
Briggs Engineering Co.....	104
Burmeister & Wain, Ltd.....	86
Brunswick-Kroeschell Co.....	93
Crane Co.....	66
Coen Co.....	79
Jas. A. Coffey Engineering Corp.....	12
Wm. Cramp & Sons Ship & Engine Building Co.....	70-71
DeLaval Separator Co.....	1/2 85
Diehl Mfg. Co.....	31
Diamond Power Specialty Corp.....	74
O. M. Edwards Co.....	15
Electric Storage Battery Co.....	1/2 84
Falk Corp.....	87
Foster Marine Boiler Corp.....	1/2 101
General Electric Co.....	3-4-5-6
Griscom Russell Co.....	60
General Carbonic Co.....	1/2 49
B. F. Goodrich Rubber Co.....	1/2 84
Hooven-Owens-Rentschler Co.....	17
Ingersoll-Rand Co.....	47
Walter Kidde & Co.....	1/2 49
Knudsen Motors Corp.....	81
London Steam Turbine Co.....	

the Business of Transportation by Water

will be Robert Colston and Benjamin P. Colings.

HILL ROTORS, INC., 42 Broadway, New York—This company will exhibit a new type of rotary liquid pump and air compressor, based, it is said, upon a new principle. There are two rotors, one inside the other, one having one less tooth than the other, and having a continuous pressure, holding engagement between the low pressure port and the high pressure port. The representatives will be: Myron F. Hill, president; Francis A. Hill, vice president; W. G. Thomson and R. G. Wolf.

WALTER KIDDE & CO., 140 Cedar street, New York—This exhibit gives an insight into two systems for detecting and extinguishing marine fires as well as an electric radiator used aboard ship.

McINTOSH & SEYMOUR CORP., Auburn, N. Y.—Attention will be drawn to its diesel engines. Representative in charge is B. P. Flint, district manager, New York office.

MARINE REVIEW, Cleveland—The exhibit will include samples of *MARINE REVIEW* and charts illustrative of the editorial, circulation and advertising service given the marine industry. Representatives will include R. V. Sawhill, H. N. Pickett, A. H. Jansson and Joseph Fuller.

NATIONAL MALLEABLE CASTINGS CO., Cleveland—This exhibit will consist of a complete line of anchor chain ranging from 5-inch wire diameter on down through the various commercial sizes. Also on display are connecting and anchor shackles of new types as well as anchor chain swivels. In attendance will be Benjamin Nields Jr., W. C. Lewis, Edward Sihler, Floyd Synder, E. E. Eyman and R. E. Valentine.

NATIONAL METER CO., 299 Broadway, New York, will exhibit a complete line of oil meters, adapted to marine service, including facsimiles of the meters installed on the *LEVIATHAN*, and on the President's yacht, the *MAYFLOWER*. George D. MacVeagh will be in charge.

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO., Newport News, Va.—This display reveals details of the company's shipbuilding facilities. The exhibit will be in charge of R. H. Lee.

PANTASOTE CO., 11 Broadway, New York—The exhibit will show a section of a passenger ship cabin which is constructed of the company's product. A wainscoting of the company's tiling will be shown as well as curtain and upholstery material. William A. Lake will be in charge.

PEABODY ENGINEERING CORP., New York—This company will exhibit its double-ported, hinged type of register fitted with mechanical burners. The double-port type of register was especially designed for high capacity on low drafts. The unit is piped up and shows all the necessary connections. Representatives will be J. P. Leask, E. B. Sadtler, S. T. Warner and R. C. Vroom.

PENTON PUBLISHING CO., Cleveland—The exhibit will include samples of *MARINE REVIEW* and charts illustrative of the editorial circulation and advertising service given the marine industry. Representatives will include R. V. Sawhill, H. N. Pickett, Joseph Fuller and A. H. Jansson.

RADIO CORP. OF AMERICA, 66 Broad street, New York—This exhibit will be a 1-kilowatt combination radio telephone and telegraph transmitter. This equipment provides three classes of radio transmission: Radio telephony, interrupted continuous wave telegraphy and continuous wave telegraphy, each of which

may be obtained instantaneously by throwing a single control, mounted on the front of the transmitter panel. Standard 2-kilowatt, 500-cycle panel transmitter of the Spark type, the prevailing type of ship equipment at this time, is also shown, as well as receiving sets. Representatives will be G. Harold Porter, general superintendent, marine department; J. B. Duffy, superintendent; E. M. Hartley, assistant superintendent; and P. C. Ringgold.

ROTO CO., Hartford, Conn.—A line of mechanical tube cleaners adapted for use in the various types of steam boilers used in the marine field will be shown as well as adaptations of these machines for cleaning heaters and condensers. A line of tools for cleaning the hand hole plates and caps of boilers will also be shown. The exhibit will be in charge of J. V. Doherty, manager of marine department; W. R. Van Nortwick, district sales manager; W. M. Kelley and F. E. Kasten.

ROW & DAVIS ENGINEERS, INC., 90 West street, New York—The apparatus exhibited will consist of the company's system for reliquidizing fuel oil without the aid of steam coils in ships' inner-bottom tanks, fuel oil heater, feed water heater, evaporator, fresh water still, steam trap and grease extractor. Those in attendance will be Mr. Row, Mr. Davis and Mr. Thompson, relieved by Mr. Smith and Mr. Young.

RUBBER-ALL CO., 821 Broadway, New York—The company will show its waterproof suits giving examples of their use. The exhibit will be in charge of Harry S. Dube, sales manager.

SCOVILL MFG. CO., Waterbury, Conn.—This display will feature cup drawn admiralty condenser tubing. The various processes involved in making condenser tubing from sheet by the cupping process will be illustrated by actual

samples and the microstructure of the finished tubing will be shown under a metallographic microscope. Numerous samples of corroded tubing, defective tubing and the best grade of material will also be shown under the microscope. Besides tubing, this company will exhibit representative samples of their brass mill products, such as sheet, rod, wire and seamless tubing as well as manufactured articles which they make from the raw materials. The representatives will be E. H. Callahan, P. Davidson, C. A. Gleason, G. B. Kerr Jr., G. T. Power, L. R. Root, M. N. Rose, C. W. Snowman, A. M. Southall, M. L. Sperry Jr., W. E. Twining, L. L. Williams.

SPERRY GYROSCOPE CO., Brooklyn, N. Y.—This display will include many interesting navigational instruments, including two complete gyro-compass equipments, a gyro-pilot or automatic helmsman, five of which during the last two years have efficiently steered five ships over 150,000 miles, helm angle indicator system, ship's log system, improved revolution indicator system, 18-inch and 36-inch high intensity searchlights and gyroscopic ship's stabilizer model. Representatives will be Robert B. Lea, manager of the marine department, and Messrs. Whitaker, Jobson, Sparling, Patterson, Bates and Hodgman.

STERLING COOPER CORP., New York—This exhibit will feature the company's marine catalog, marine engineer's handbook and radio manufacturers' catalog.

SUBMARINE SIGNAL CORP., 160 State street, Boston—Among the devices shown is the submarine bell, the submarine oscillator, a submarine sounder for use on lifeboats and dories, as well as a portable submarine direction finder for locating these small craft in fog.

SUPERHEATER CO., 17 East Forty-second street, New York—The equipment will consist of a model of the fire tube superheater as applied to the Scotch marine type boiler, model of the superheater as applied to the marine watertube boiler and boilers used on Mississippi river boats, and steam pyrometers for measuring temperatures. The representatives will be H. B. Oatley, G. E. Ryder, C. A. Brandt, G. E. Kershaw, W. McLintock, G. L. Moore, J. A. Barnes and L. H. A. Weaver.

TEXAS CO., New York—The exhibit includes a miniature oil derrick and a full line of marine lubricants. Those in attendance will be Frank J. Shipman, H. W. Schilling, E. A. Lobb, A. St. James, G. C. Bartlum and J. L. Ward.

P. S. THORSEN & CO., INC., 81 Coffey street, Brooklyn, N. Y.—This exhibit includes a complete line of insulating materials shown applied to pipes, boilers, etc., together with practical demonstrations of the losses from bare surfaces and the savings which can be effected by proper insulation.

W. & J. TIEBOUT CO., New York—The exhibit will consist of a careful selection of items from the company's comprehensive stock of marine hardware and supplies. This firm will be represented by John Tiebout Sr., John Tiebout Jr., George V. Carlin, Henry Devereaux, John D. Gillespie, Fred Korn, E. T. Linsley, Frank J. Morrissey and Charles H. Schult.

TODD OIL BURNER & ENGINEERING CORP., 742 East Twelfth street, New York—This exhibit will feature a twin-pole arc welder, oil burning galley range and fuel oil burners for marine and land installation. The exhibit will be in charge of Robert G. Payne, sales manager; A. J. Holifield, demonstrating the welder, and J. A. H. Hood in charge of the galley range display. Arnold L. Wernert, instructor, Todd oil burner school, will be present.

VALENTINE & CO., 456 Fourth avenue,

Main Floor Exhibitors

	Booth Number
Lunkenheimer Co.	95
Marine Decking & Supply Co.	110
Morse Drydock & Repair Co.	72
MARINE REVIEW	30
McIntosh & Seymour Corp.	59
National Malleable Castings Co.	57
National Meter Co.	14
Newport News Shipbuilding & Drydock Co.	32
New London Ship & Engine Co.	75
New York Journal of Commerce	50
New York Marine News	83
Northern Fire Apparatus Co.	54
Pantasote Co.	28
Peabody Engineering Corp.	13
Port of Baltimore	38-39
Radio Corp. of America	48
Row & Davis Engineers Inc.	63
Rubber-All Co.	69
Shipley Construction & Supply Co.	33
Simmons Boardman Publishing Co.	94-106
Sun Shipbuilding & Drydock Co.	78
Sperry Gyroscope Co.	20-21-22-23
Scovill Mfg. Co.	58
Sterling Cooper Corp.	67
B. F. Sturtevant Co.	107
Superheater Co.	73
Todd Shipyards Corp.	92-108
Texas Co.	35
P. S. Thorsen & Co.	98
W. & J. Tiebout Co.	27
Valentine & Co.	43
C. H. Wheeler Mfg. Co.	7
Westinghouse Electric & Mfg. Co.	82
Worthington Pump & Machinery Corp.	96

New York—The exhibit is arranged to show the waterproofness of the company's product. Representatives will be Messrs. Hale Pufisfer, Walker and Freeman.

WELIN DAVIT & BOAT CORP., 305 Vernon avenue, Long Island City, N. Y.—The exhibit shows models of various types of quadrant davits with lifeboats attached as well as the company's red lead. The booth is in charge of Capt. Lewis Tanning, Harry F. Sailor, Walter J. Krolman, O. J. Slaght, Charles White and R. E. Keppler.

C. H. WHEELER MFG. CO., Lehigh and Sedgley avenues, Philadelphia—This concern is exhibiting a new type of air pump designed for closed water systems, several marine type condensate pumps, a dynamometer and an aug-

Second Floor Exhibitors

	Booth Number
Crane Packing Co.	227
Electro Sun Co.	253
Fire Detecting Wire Corp.	335-336
L. W. Ferdinand & Co.	228
A. F. Hamacek Marine Corp.	229
Hill Rotors, Inc.	252
Marine Journal	265
Natural Carbonic Gas Co.	267
New York Towboat Exchange	278-293
Pioneer Co.	314
Port of Charleston, S. C.	257-258
Port of Jacksonville, Fla.	272
Port of Portland, Oreg.	255
Roto Co.	266
Submarine Signal Co.	256
Welin Davit & Boat Corp.	254

menter. The representatives will be G. L. Kothny, manager marine department; Charles Lang, manager New York office; J. J. Mullan and J. Dobson.

WORTHINGTON PUMP & MACHINERY CORP., New York—This company manufactures pumps of every type and for every service, meters, air compressors, diesel engines for propulsion and auxiliary usage, and condensers to meet the requirements of any steam installation. The exhibit will include a variety of pumps and meters, and a 2-cycle, solid injection engine. This engine will have its working parts exposed in order to show the construction. Representatives will be: L. Katzenstein, W. A. Cather, I. W. Jackman, C. B. Humphrey and J. J. Morch.

Main Events Planned for Marine Week

On Thursday at 10 a. m., the congress will meet at the Waldorf-Astoria hotel and will hold morning and afternoon sessions on that day and on Friday. Herbert Hoover, secretary of commerce, will be the presiding officer at the opening session on Nov. 8. Subsequent sessions will be presided over by prominent representatives of the major participating groups.

Arrangements have been worked out through the courtesy of steamship owners and operators and the United States government, so that delegates to the congress may visit certain ships and see for themselves something of the port and shipping of New York. An opportunity will be offered to inspect the latest superdreadnaught of the navy, the U. S. S.

COLORADO, a fine example of the advanced accomplishments in naval design, construction and mechanical efficiency. Cargo vessels, oil tankers and passenger vessels, including the great LEVIATHAN, will also be open for inspection. Special interest should center about the SEEKONK as an example of what can be done by American shipbuilders in converting present type steam vessels to diesel drive. The passenger liners CLEVELAND and WESTPHALIA will also prove interesting as fine examples of modern liners.

The only social function of the congress will be a banquet to be held under the auspices of the American Marine association on Thursday, Nov. 8, at 7:30 p. m. at the Waldorf-Astoria hotel.

Program of Business Sessions of American Marine Congress

- Wednesday, Nov. 7**
- 10:30 a. m. Meeting of Resolutions committee, committee room, Waldorf-Astoria hotel.
- Thursday, Nov. 8**
- 10:00 a. m. American Marine congress convenes, Grand ball room, Waldorf-Astoria hotel.
- Reports and Discussions of the following committees at this session:
1. Shipyards committee.
 2. Diesel Engine committee.
 3. Manufacturers committee.
 4. Agricultural committee.
- 2:00 p. m. Second session American Marine congress, Grand ball room, Waldorf-Astoria hotel.
- Reports and Discussions of the following committees at this session.
1. Ship Owners and Operators committee.
 2. Coastwise shipping committee.
 3. Inland Waterways committee.
 4. Ports and Terminals committee.
- 7:00 p. m. Reception Grand ball room, Waldorf-Astoria hotel.

- 7:30 p. m. American Marine Congress dinner, Grand ball room, Waldorf-Astoria hotel.

- Friday, Nov. 9**
- 10:30 a. m. Third session, roof garden, Waldorf-Astoria hotel.
- Reports and discussions on the following committees at this session.
1. Great Lakes Shipping committee.
 2. Standardization committee.
 3. Marine Insurance and Classification committee.
 4. Transportation committee.
- 1:00 p. m. Final session, roof garden, Waldorf-Astoria hotel.
- Reports and discussions of the following committees at this session.
1. Towing and Lighterage committee.
 2. Banking committee.
 3. Exports committee.
 4. Imports committee.
- Adjournment.
- From 12.30 to 10:30 p. m. each day, Nov. 5-10, marine exhibition at Grand Central Palace.

Naval Architects Will Discuss Eleven Timely Papers

Professional sessions at the thirty-first general meeting of the Society of Naval Architects and Marine Engineers will begin at 10 a. m. The meetings will be held in the Engineering Societies building, 29 West Thirty-ninth street, New York.

Thursday, Nov. 8, 1923

- 1.—"Additional Notes on American Shipyard Apprenticeships, Evening Schools and Scholarships," by Charles F. Bailey, member of council.
- 2.—"Comments on Aviation, Naval and Commercial," by Capt. Emory S. Land, C. C. U. S. N., member.
- 3.—"Some Factors Affecting the Economy of Operation of the Lake Freighters," by Prof. Anders Lindbald, member.
- 4.—"Wetted Surface," by Henry H. Schulze, member.
- 5.—"Propeller Design Based Upon Model Propeller Experiments," by Rear Admiral David W. Taylor, C. C. U. S. N., retired, honorary vice president.

Friday, Nov. 9, 1923

- 6.—"The Probable Effect Upon Ports of the Probable Growth of Ships," by Commander John H. Walsh, C. C. U. S. N., retired, member.
- 7.—"The Economics of Transatlantic Liners of Various Lengths," by Carl E. Peterson, member.
- 8.—"The Manufacture of Heavy Steel Castings for Ships with Special Reference to Stern Frames, Rudders, Shaft Brackets and Stems," by Hugo P. Frear, member of council.
- 9.—"Fuel Conservation and Engineering Performance Standards by Shipping Board Vessels," by Joseph E. Sheedy, member.
- 10.—"Some Considerations on the Conversion of Steamships to Motorships," by Robert Haig, member of council.
- 11.—"Machinery Trials, Coast Guard Cutter Modoc," by Capt. Q. B. Newman, U. S. C. G., member.

Third Marine Week Is Greatest

National Interest in Engineering Exhibition, Marine Congress and Naval Architects' Meeting Keener than in Two Preceding Years—Both Political and Technical Progress Being Made

MORE than ever before, marine week, Nov. 5-10, 1923, will include in its program events of the greatest importance to the marine industry. During this week at the Grand Central palace, Lexington avenue and Forty-sixth street, New York, will be held the third annual marine exposition conducted by the American Marine Association, Inc., a co-operative organization composed of shipbuilders, shipowners and operators, engine builders and marine equipment manufacturers.

An American Marine congress composed not only of representatives of the marine industry but also of leaders of allied trades, of the government and of the general public has been invited by the American Marine association to convene at the Waldorf-Astoria hotel, New York City, during marine week, on Nov. 8 and 9. The purpose of this congress is to review the present status of American shipping and to determine measures necessary to place the American merchant marine on the road to permanent growth and success. Especial attention will be directed to methods of increasing the competitive capacity of American ships.

The Society of Naval Architects and Marine Engineers will hold its thirty-first general meeting in the Engineering Societies building, 29 West Thirty-ninth street, New York, on Thursday and Friday, Nov. 8. and 9.

Annual Marine Exhibition

A list of exhibitors at the exposition and their booth numbers appear elsewhere in this insert, as well as a short detailed description of each exhibit and the names of representatives attending. The number and high quality of the exhibitors insures this marine show being of the greatest interest and educational value not only to everyone associated with the marine and allied industries but to all persons seeking a comprehensive and detailed picture of the progress of the shipping, shipbuilding and marine equipment activities of the country. The delegates to the American Marine congress will have free access to the exposition and will thus be enabled to see for themselves the technical skill developed in this country. The exhibition is open daily from 12:30 to 10:30 p. m.

American Marine Congress

In order to accomplish in a practical manner the purpose of this congress, various committees organized over two months ago have been considering particular phases of the problem. Consequently when the congress convenes it will at once have placed before it a comprehensive survey of the present status of shipping, shipbuilding, volume and character of trade and proportion carried in American ships, costs of operation and comparisons with foreign ships, diesel drive, loading and discharging, insurance, personnel, safety and numerous other detailed studies with recommendations for overcoming present handicaps.

The Marine congress will have the work of these

committees as concrete data on which to base its discussions and for formulating practicable resolutions crystallizing the opinions of the most widely separated and diversified elements in the country in any way interested in establishing an American merchant marine.

The first meeting in connection with the congress will be that of the resolutions committee on Wednesday, Nov. 7. This committee is composed of the chairmen of all district and technical committees with the vice chairman of the central committee as chairman. It will be the duty of this committee to assemble, consider, revise and co-ordinate the reports and recommendations of the district and technical committees for presentation before the congress itself.

The group of organizations whose cordial support of the marine congress has been enlisted, numbers many interests not associated previously with the efforts to revive America's marine strength. For that reason, organizers of the congress are hopeful that a clearer appraisal of the essential value of shipping strength to the nation will follow this meeting, bringing the assurance of definite results.

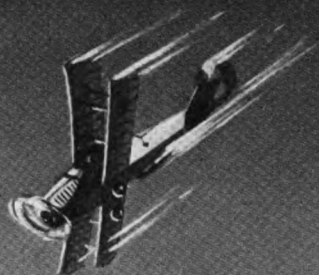
Naval Architects and Marine Engineers

Of the 11 papers to be presented at the thirty-first general meeting of the Society of Naval Architects and Marine Engineers, seven papers by civilians and two papers by retired naval officers deal with subjects of direct interest in the design and operation of merchant ships.

Of particular significance in the present status of the mercantile marine are the following papers, "Some Factors Affecting the Economy of Operation of Lake Freighters," "Propeller Design, Based Upon Model Propeller Experiments," "Probable Effect Upon Ports of the Probable Growth of Ships," "Economics of Transatlantic Liners of Various Length," "Fuel Conservation and Engineering Performance Standards by Shipping Board Vessels," "Some Considerations on the Conversion of Steamships to Motorships." These papers show the thought and effort directed to the consideration of matters of interest and real importance to the merchant marine, that is brought to general notice through the functions of the society.

One of the features of the meetings of the Society of Naval Architects and Marine Engineers which has begun to take on the flavor of a fine old tradition, is the annual banquet ending the two days' meetings. There is a distinction and charm associated with this event which does great credit to the guests, officers and members of the society. Distinguished Americans and visiting foreigners have deemed it a privilege to attend, and the speeches delivered have been received with special interest throughout the country. The banquet this year will be held in the Grand ball room of the Waldorf-Astoria, New York, on Friday, Nov. 9, at 7:30 p. m. As in previous years, there will be a reception, prior to the banquet, beginning at 7:00 p. m., at which an opportunity is offered for friendly social intermingling and the meeting of old friends.

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Marine Review



Fast liner LEVIATHAN which is expected to set record for transatlantic passage

Speed Records on the Atlantic

Past Performances of Six Fastest Liners Are
Compiled to Show Which Holds Speed Title

SPEED, in the air, on land and water is the urge of the times.

The desire for speed and the willingness on the part of the public to patronize fast ships has been an extremely important factor in developing the science of naval architecture and shipbuilding. The continent of Europe at Cherbourg, France, is separated from the continent of North America at New York by a distance of about 3100 nautical miles. To cover this distance in 5 days and a few hours means a remarkable, sustained performance, a performance which would be utterly impossible did not the brains and skill of men highly trained enter into the design, construction and operation of the ship. Since no high development of an art is possible without the demand, the desire for speed, and the willingness to pay for it, is directly responsible for this result.

To attain high speed not only great power and efficiency in the machinery and corresponding use of large amounts of fuel, is necessary, but also the utmost possible efficiency must be reached in the application of this power to its main function of driving the ship through the water, and the shape, dimensions and characteristics

of the hull must be such as to give a minimum of resistance. The correct solution of the above problems means in the ultimate analysis the improvement and refinement of all features of hull and machinery, and the results are reflected in a general advance in all types of ships. It is not solely as a sporting performance or in the time saved, therefore, that the attainment of high speed in passenger liners, is of importance to the merchant marine.

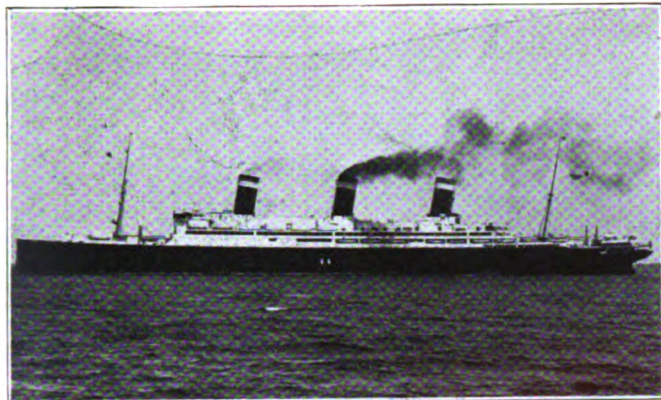
Records Are Confusing

The large transatlantic steamship lines, recognizing the advantage of speed in conjunction with size and luxurious accommodations, in drawing passengers to their ships never fail to capitalize on new records made. It may be frankly admitted that there is no consensus of opinion among the leading lines as to "the fastest passenger liner afloat." Claims to the record transatlantic passage have been made at different times by one or another company when a new record for one of their ships is made. As a result, considerable confusion exists not only in the lay mind but also in the minds of those in more or less close contact with the performance

of the individual ships, just how those records stand in comparison one with the other.

It is the intention in this article to clear up such confusion as may exist in regard to speed records across the Atlantic, in so far as it may be possible to do so by gathering together in one place the best records, up to the present time, of the fastest passenger liners now in this service. The figures used have been received directly from the steamship lines concerned and are, therefore, authentic, as of course each line is prepared to vouch for their correctness.

From the tables on pages 406 and 407, it will be noted that the record passage from New York to Cherbourg is held by the White Star liner MAJESTIC, and the record passage from Cherbourg to New York is held by the Cunard liner MAURETANIA. The MAURETANIA also holds the record between New York and Queenstown both ways made 13 years ago while she was still a coal burner. The record average speed per hour over an entire voyage is that of 26.06 knots made by the MAURETANIA in the Queenstown run back in 1910. A record average speed per hour during a New York-Cherbourg run of those

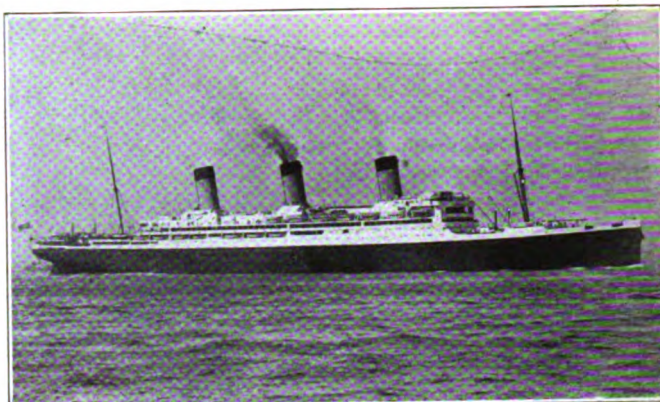
**S. S. LEVIATHAN**

LEVIATHAN—Gross tons 59,956.
L. O. A., 949.75 ft.
Beam, 100.0 ft.
Depth to D deck, 70.35 ft.
Four screws.
No. of Boilers—46 watertube.
Turbines, direct-connected—4.
S.H.P. @ 180 r.p.m. 65,000.
Passenger capacity—973 first,
548 second, 944 third, 934
fourth.

**FASTEST RUNS—NEW
YORK-CHERBOURG**

DIRECTION—Eastward.
DATE—September, 1923.

TIME—5 days, 8 hrs, 38 min.
HIGHEST DAY'S RUN—586
miles.
DISTANCE COVERED—3192
miles.
AVERAGE SPEED—24.81
knots.
DIRECTION—Westward.
DATE—July, 1923.
TIME—5 days, 12 hrs., 11 min.
HIGHEST DAY'S RUN—605
miles.
DISTANCE COVERED—3160
miles.
AVERAGE SPEED—23.9
knots.

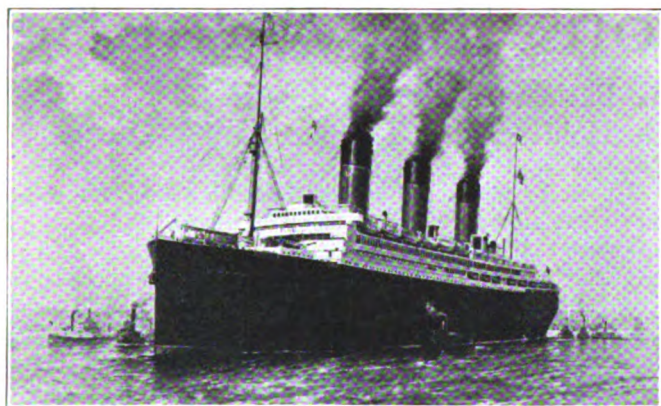
**S. S. MAJESTIC**

MAJESTIC—Gross tons 56,551.
L. O. A. 954.5 ft.
Beam 100.0 ft.
Depth 64.2 ft.
Four screws.
No. of Boilers, 48 watertube.
Turbines, direct-connected—4.
S. H. P. @ 180 r.p.m., 66,000.
Passenger capacity—875 first,
800 second, 2438 third.

**FASTEST RUNS—NEW
YORK-CHERBOURG**

DIRECTION—Eastward.
DATE—September, 1923.
TIME—5 days, 5 hrs., 21 min.

HIGHEST DAY'S RUN—590
miles.
DISTANCE COVERED—3104
miles.
AVERAGE SPEED—24.76
knots.
DIRECTION—Westward.
DATE—June, 1923.
TIME—5 days, 12 hrs., 18 min.
HIGHEST DAY'S RUN—608
miles.
DISTANCE COVERED—3196
miles.
AVERAGE SPEED—24.15
knots.

**S. S. BERENGARIA**

BERENGARIA—Gross tons 52,226.
L. O. A. 919.0 ft.
Beam 98.4 ft.
Depth 63.0 ft.
Four screws.
No. of Boilers—46 watertube.
Turbines, direct-connected—4.
S. H. P. @ 185 r.p.m. 61,000.
Passenger capacity—979 first, 750
second, 1553 third.

**FASTEST RUNS—NEW
YORK-CHERBOURG**

DIRECTION—Eastward.
DATE—May, 1923.
TIME—5 days, 10 hrs., 50 min.

HIGHEST DAY'S RUN—538
miles.
DISTANCE COVERED—2920
miles.
AVERAGE SPEED—22.32
knots.
DIRECTION—Westward.
DATE—June, 1922.
TIME—5 days, 13 hrs., 02 min.
HIGHEST DAY'S RUN—550
miles.
DISTANCE COVERED—3004
miles.
AVERAGE SPEED—22.58
knots.

**S. S. OLYMPIC**

OLYMPIC—Gross tons 46,439.
L. O. A. 882.7 ft.
Beam 92.5 ft.
Depth 65.7 ft.
Three screws.
No. of Boilers—29 Scotch.
Turbines, direct-connected—2
Triple Expansion, 4 cylinder.
S.H.P.—18,000, I.H.P.—37,000.
Passenger capacity—947 first,
770 second, 1254 third.

**FASTEST RUNS—NEW
YORK-CHERBOURG**

DIRECTION—Eastward.
DATE—November, 1921.

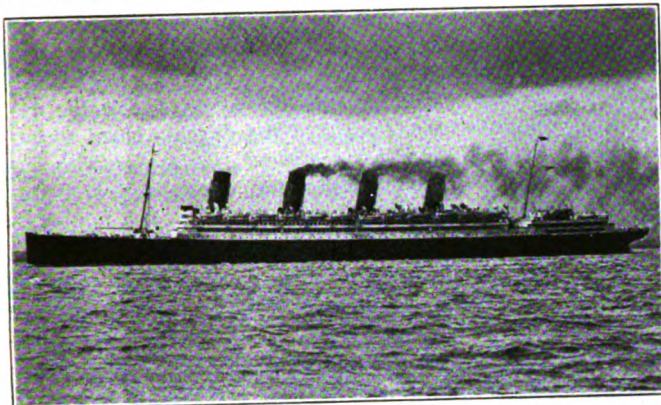
TIME—5 days, 12 hrs., 38 min.
HIGHEST DAY'S RUN—531
miles.
DISTANCE COVERED—2999
miles.
AVERAGE SPEED—22.61
knots.
DIRECTION—Westward.
DATE—October, 1921.
TIME—5 days, 12 hrs., 39 min.
HIGHEST DAY'S RUN—553
miles.
DISTANCE COVERED—2931
miles.
AVERAGE SPEED—22.1 knots.

listed in the table, 25.27 knots, was made by the MAURETANIA on her eastward trip in July, 1922.

For present day performance in speed, the six fastest transatlantic liners may be divided into two groups of three each according to speed and with little to choose from in each group to show which is the fastest ship. In the first group may be placed without

chance of argument, the LEVIATHAN, MAJESTIC and MAURETANIA, in the second group the AQUITANIA, OLYMPIC and BERENGARIA. It is very likely that the elapsed time between the ports of New York and Cherbourg will be bettered almost any time in the near future by one of the ships in the first group. A combination of good weather, the shortest route and machinery

tuned up and working at its best will inevitably mean a new record. Owing to her recent reconditioning and comparatively short period of service, the LEVIATHAN may be considered the promising dark horse for ultimate honors. At the present writing the records speak for themselves and it is only fair play to let the honors rest where they belong.



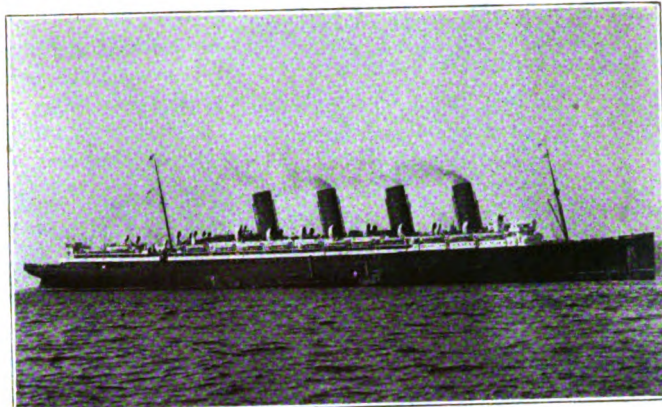
S. S. AQUITANIA

AQUITANIA—Gross tons 45,647.
L. O. A. 901.0 ft.
Beam 97.0 ft.
Depth 64.0 ft.
Four screws.
No. of Boilers—23 Scotch
Turbines, direct-connected—4.
S. H. P. @ 175 r.p.m. 56,000.
Passenger capacity—778 first,
641 second, 1706 third.

FASTEST RUNS—NEW YORK-CHERBOURG

DIRECTION—Eastward.
DATE—May, 1922.
TIME—5 days, 11 hrs., 28 min.

HIGHEST DAY'S RUN—568 miles.
DISTANCE COVERED—3091 miles.
AVERAGE SPEED—23.51 knots.
DIRECTION—Westward.
DATE—September, 1921.
TIME—5 days, 16 hrs., 19 min.
HIGHEST DAY'S RUN—602 miles.
DISTANCE COVERED—3164 miles.
AVERAGE SPEED—23.21 knots.



S. S. MAURETANIA

MAURETANIA—Gross tons 30,704.
L. O. A. 790 ft.
Beam 88.0 ft.
Depth 57.0 ft.
Four screws.
No. of Boilers—25 Scotch.
Turbines, direct-connected—4.
S. H. P. @ 195 r. p. m. 68,000.
Passenger capacity—550 first,
500 second, 974 third.

FASTEST RUNS—NEW YORK-QUEENSTOWN

DIRECTION—Eastward.
DATE—September, 1909.
TIME—4 days, 13 hrs., 41 min.
HIGHEST DAY'S RUN—614 miles.
DISTANCE COVERED—2809 miles.
AVERAGE SPEED—25.78 knots.
DIRECTION—Westward.
DATE—September, 1910.
TIME—4 days, 10 hrs., 41 min.

HIGHEST DAY'S RUN—676 miles.
DISTANCE COVERED—2780 miles.
AVERAGE SPEED—26.06 knots.

FASTEST RUNS—NEW YORK-CHERBOURG

DIRECTION—Eastward.
DATE—July, 1922.
TIME—5 days, 8 hrs., 9 min.
HIGHEST DAY'S RUN—3,239 miles.
DISTANCE COVERED—3,239 miles.
AVERAGE SPEED—25.27 knots.
DIRECTION—Westward.
DATE—October, 1922.
TIME—5 days, 7 hrs., 33 min.
HIGHEST DAY'S RUN—3,076 miles.
AVERAGE SPEED—24.11 knots.

Shipping Board Leases Floating Drydocks

A 10,000-ton 5-section wooden drydock, now at Weehawken, N. J., has been leased by the shipping board to the Todd Shipyards Corp., New York. Another drydock of the same type has been leased to the Sun Shipbuilding & Dry-

dock Co., Chester, Pa. This dock is now at Mill basin, Jamaica bay, and will be towed by the Sun Company to Philadelphia. A third dock of

has been leased to the Alderton Dock Yards, Ltd., Brooklyn. Negotiations are pending for the lease of a 6000-ton drydock to be located at Jacksonville, Fla.

Under the terms of the leases, the lessors are charged with the upkeep of the docks, the shipping board reserving the right to sell the docks at any time. The lessors have the privilege of purchasing the docks under competitive bidding.

Summary of Transatlantic Fastest Runs

New York-Cherbourg Eastward

Eastward								High day's run	Dist. covered	Aver. speed
Line	Name of Ship	Time			Date		naut. Miles	naut. Miles	knots	
		Days	Hours	Minutes	Month	Year				
White Star	MAJESTIC....	5	5	21	Sept.	1923	590	3,104	24.76	
Cunard	MAURETANIA....	5	8	9	July	1922	...	3,239	25.27	
U. S. Line	LEVIATHAN....	5	8	38	Sept.	1923	586	3,192	24.81	
Cunard	BERENGARIA....	5	10	50	May	1923	538	2,920	22.32	
Cunard	AQUITANIA....	5	11	28	May	1922	568	3,091	23.51	
White Star	OLYMPIC....	5	12	38	Nov.	1921	531	2,999	22.61	

Westward

		Westward					High day's	Dist.	
		Time			Date		run	covered	Aver.
Line	Name of Ship	Days	Hours	Minutes	Month	Year	naut. Miles	naut. Miles	speed knots
Cunard	MAURETANIA....	5	7	33	Oct.	1922	...	3,076	24.11
U. S. Line	LEVIATHAN....	5	12	11	July	1923	605	3,160	23.90
White Star	MAJESTIC....	5	12	18	June	1923	608	3,196	24.15
White Star	OLYMPIC....	5	12	39	Oct.	1921	553	2,931	22.10
Cunard	BERENGARIA....	5	13	02	June	1922	550	3,004	22.58
Cunard	AQUITANIA....	5	16	19	Sept.	1921	602	3,164	23.21

New York-Queenstown Westward

Westward							High day's run naut.	Dist. covered naut.	Aver. speed knots
Line	Name of Ship	Time			Date		Miles	Miles	
		Days	Hours	Minutes	Month	Year			
Cunard	MAURETANIA	4	10	41	Sept.	1910	676	2,780	26.06
Eastward							High day's run naut.	Dist. covered naut.	Aver. speed knots
Line	Name of Ship	Time			Date		Miles	Miles	
		Days	Hours	Minutes	Month	Year			
Cunard	MAURETANIA	4	13	41	Sept.	1909	614	2,809	25.78

Gets Contract for Barge

The Midland Barge Co., Pittsburgh, has received a contract from E. T. Slider, Louisville, Ky., for constructing a steel dredgeboat hull and cabin. It will be 176 feet long, 50 feet wide and 6 feet deep. The company has completed the construction of the last of an order of 10 barges for the La Belle Transportation Co. The hull for the towboat SLACK BARRETT of the Barrett line has been erected. This boat will be 175 feet long and 38 feet wide. It will be equipped with compound condensing engines. From the boiler deck down it will be entirely of steel, while the cabin also will be mostly of steel construction.

New and Repair Orders for Pacific Yards

During the past month, the shipping board has ordered six vessels put into condition for spot service, presumably for entrance into the Japanese trade. Contracts have been let for reconditioning the steamers WEST HOLBROOK, WEST MINGO, WEST MONTROP, WEST CAJOOT and LIBERTY LAND that have been on the mud flats at Benicia, Cal., and the WEST HIXON, from Portland, Oreg. Shipyard activity around San Francisco bay has been active and much new work is in sight. It is stated that the Key Route system is planning the construction of another diesel-electric ferry boat, though confirmation could not be obtained.

The Matson Navigation Co. plans to construct a new fast extra fare passenger liner, for service between San Francisco and the Hawaiian islands. While details have been withheld, it is stated, upon reliable authority, that bids will be called for some time during the next six months. As tentatively projected, the new vessel would have a sustained speed of 22 knots and will be capable of making the run to Honolulu in four and a half days. The present record, held by the company's steamer MAUI, is five days and 22 hours.

Officials of the company state that

accommodations for 500 passengers would be provided and that only 2500 tons of cargo would be carried. Two types of engines are being considered, turbo-electric and steam turbine. The approximate cost of the new vessel would be \$6,000,000.

Contracts Awarded for Repair Work

Hanlon Drydock Co., Oakland, Cal., secured the reconditioning and repairing of the shipping board steamer WEST MONTAUK for the sum of \$15,620.

Bethlehem Shipbuilding Corp., San Francisco, secured contract for conversion of the steamer ADMIRAL GOODRICH recently purchased subject to inspection by the National Steamship Co. from the Admiral line, into a lumber carrier for \$13,000.

The same yard also has the contract for reconditioning the steamers POINT ADAMS and POINT BONITA for the Hammond Lumber Co., who recently purchased the vessels from the Pacific Mail Steamship Co. The work calls for the removal of the upper decks and other alterations. Vessels are now to be employed in the lumber trade. Cost of repairs is approximately \$175,000.

Bethlehem also has the contract for repairing the General Petroleum Corp.'s steamer TEJON, ex-CITY OF RENO, which struck a submerged object off the south-

ern coast of California, at \$61,898 in 18 days.

The Moore Drydock Co., Oakland, Cal., secured the contract for the reconditioning of the shipping board steamer WEST HOLBROOK, for spot service, including drydocking, engine work and general repairs, at \$12,991.

The Crowley Marine Railways, San Francisco, secured the contract for reconditioning the shipping board steamer WEST CAJOOT, for spot service at \$16,002 and for reconditioning of the shipping board steamer WEST MAHWAH, for spot service, at \$14,000.

The General Engineering & Drydock Co., San Francisco, secured the contract for reconditioning the shipping board steamer WEST CONOB, for spot service, mostly deck and engine repairs, at \$12,233; the shipping board freighter, LIBERTY LAND, for spot service, at \$14,110; the shipping board steamer WEST MINGO, for spot service, at \$21,540; general repairs on the army transport GENERAL FRANK M. COXE at \$4294; general repairs on the steamer POINT ARENA, at \$5000; conversion of the Mexican Steamship Co.'s steamer WASHINGTON, from coal to oil burner at \$15,000.

The Todd Drydock & Construction Corp., Tacoma, secured the contract for repairs on the steamer ADMIRAL SEBREE of the Admiral line at \$12,500.

Free School for Teaching Oil Burning

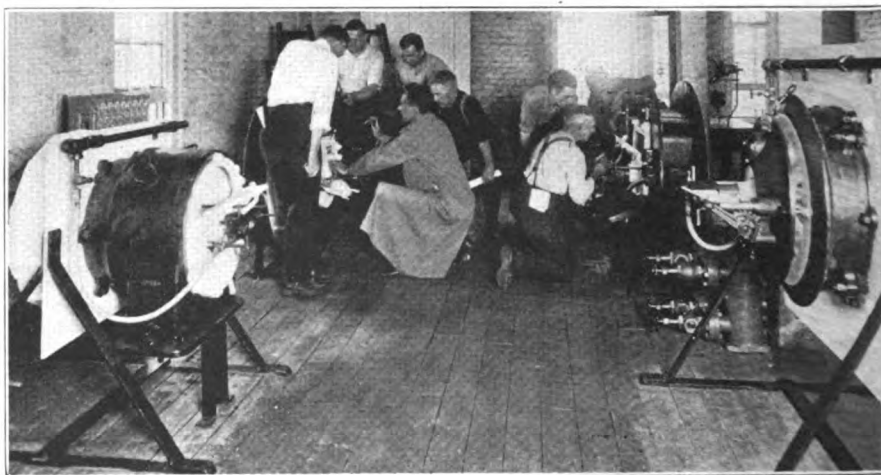
USE of oil as a fuel has increased with great rapidity in the last few years in both stationary and marine installations. In marine practice particularly, the increase is startling. According to the bureau of navigation of the department of commerce, at the end of 1922 the world's fleet included 2694 steam engined merchant vessels of 500 gross tons and over, burning oil. This figure represents an increase of 262 vessels over the number at the end of 1921. At the end of 1914 only 441 merchant vessels in the world of over 500 gross tons were oil burners. The above clearly indicates the strong trend to the use of fuel oil, and in present new shipbuilding, the percentage of oil burners over coal is steadily increasing.

In the comparatively short period of time since the beginning of the use of fuel afloat remarkable improvements have been effected in types of oil burners, in structural work on compartments in the ship in which the oil is carried, in auxiliary equipment such as heaters, pumps, strainers and transfer piping, methods for liquifying the oil in cold weather, and in

proper air supply. Not only have these mechanical improvements been made but correct methods of operation have been developed through study, special experimentation and practical lessons learned in using oil burning equipment.

Two factors mainly affect efficient and satisfactory operation of an oil

burning outfit, assuming that good fuel oil is used; *first*, that the burner and all accessory equipment and installation is proved and tested to be mechanically correct in principle and workmanship, *second*, that the engineer personnel thoroughly understands every angle of successful operation of the oil burning equipment. Every one



STUDENTS OPERATING FULL SIZE SAMPLE OIL BURNER INSTALLATION

acquainted with the mechanical operation of ships realizes the tremendous waste in power because fuel is burned by using poorly designed and carelessly constructed and installed oil burning equipment coupled with a lack of knowledge and experience or carelessness on the part of the boiler room operating staff.

The Todd Shipyards Corp., New York, known as a large repairer of ships and in a lesser degree as a shipbuilder, long ago realized the tremendous importance to the merchant marine of the two major factors mentioned above for successful and economical burning of fuel oil. Their engineers and expert mechanics have in the development of a mechanically first class oil burner greatly contributed to the advance of this art. Other companies have done the same. The Todd company is now however, a pioneer among industrial concerns in the second factor of successful oil burning, that is in a definite attempt to organize and maintain a practical school for teaching firemen, oilers, assistant engineers and chief engineers, correct principles and practical operation of oil burners. This is done in order to aid in spreading correct information on the use of oil burning equipment and in the determined war on waste and inefficiency, along which lines lie the best chances for upbuilding the merchant marine.

This school was organized in August 1923 at the Todd Oil Burner & Engineering Corp., 742 East 12th street New York. It is under the direct supervision of James McDonald vice president and general manager of this plant and is free to any one interested who wishes to take the course. An instructor fully equipped in practical knowledge and the underlying principles of the subject conducts the classes. The course covers a period of five days during the hours from 9 a. m. to 12 noon, beginning on Monday and ending on Friday. Enrollment in the class is made simple and entirely devoid of formality. The prospective student merely applies to the instructor in person or by letter. At the end of the course, a certificate is given stating that a course of instruction in the operation and care of fuel oil burning systems for marine and stationary installations has been completed.

The method of instruction is interesting. The instructor first covers the fundamental principles underlying oil burning, the nature of fuel oil and its characteristics and the terms used, the principles of combustion as well as the description of all the different



CLASS RECEIVING INSTRUCTION IN COMBUSTION AND IN OIL BURNER OPERATION

parts in a fuel oil installation and the care of such parts. Then the actual procedure in operating a system is covered in detail. All this is in the nature of ground work and is given in the form of simple lectures with questions asked and answered by the students and instructor.

An entire floor in one of the buildings is devoted to the classroom work and practical demonstrations come from using a complete outfit of valves, piping, heaters, pumps, and the burner itself. Each student in turn is required personally to manipulate the valves for operating the entire installation, in this way proving that they have grasped the instruction given in the lectures. After having become thoroughly familiar with the proper method of procedure in operating the class room equipment, the students are taken into the boiler room of the plant where a boiler is equipped with an oil burner and where pumps, heaters, strainers, fuel oil lines and in fact all the parts of a regular oil burning installation are set up. Here the students go through step by step of the manipulations made in the actual operation of a complete oil burning installation including the lighting of the burner.

Proper pressure and temperature of the oil, amount of air, size of burner tips are all carefully observed and worked out in actual operation to obtain the best results, and the effect of improper pressure, temperature, size of burner tips and amount of air is tried out and the resulting effect noted and corrected. In other words, at the end of the period of instruction the student is posted on correct operation and the causes for difficulties that

arise in practical operation, so that he may know the reasons for improper and peculiar behavior of the burner and be able to correct it in practice.

A fireman or an oiler, and even a licensed engineer, in their daily work on board ship can not get the fundamental principles and accurate and detailed information about cause and effect on all the ins and outs of oil burning in the manner in which it is given in these practical instructions as each problem is known and specifically emphasized and means of overcoming the problem are pointed out. Even for an engineer who has been operating a oil burning installation, a great deal of good would accrue from such a course. Attention is concentrated on the specific subject of efficient and correct methods for maximum results, while in the engineer's daily duties on board ship, that problem is only one among many which belong to his office.

Practical instruction of this kind is an extremely useful and valuable service to the merchant marine. Steamship companies would undoubtedly benefit greatly by arranging to have their engine room forces take advantage of such a course at their suggestion, and on their time. Many ships are in port for a period of five days, the time necessary for the course, and without interference with the work of the ship in port, two or three members of the engine room force could be readily detailed to pursue these practical studies. The benefit to the companies doing this would be immediate and definite.

More than ever today the American merchant marine needs to take stock

of its methods of operation in order to eliminate waste and inefficiency. By concentrated efforts on the part of all concerned and constantly emphasizing the need of economy and care in specific branches of operation good results are bound to come. The new school is a form of practical co-operation which distinctly helps the individual improvement of the men and obtains better and more efficient operation of the ship and care of the equipment in their charge.

To Build Diesel Dredge— Six Barges Ordered

Construction of a new 30-inch suction dredge of the diesel-electric type has been ordered by the Port of Portland. It is planned to have this dredge the most powerful of its kind in the world. Power will be furnished by four diesel engines with a combined horsepower of 2500. The cost is estimated at \$500,000. Port engineers are now engaged in drawing plans. The new dredge will be used in conjunction with three other smaller dredges now operating for the port of Portland in enlarging facilities for deep sea vessels.

Underbidding Pacific coast competitors as well as eastern yards, the Todd Drydock & Construction Corp., Tacoma, has been awarded a contract for constructing six steel barges for the corps of engineers of the army. The barges are to be built for \$19,150 each or a total of \$114,900, this being the largest steel construction job awarded in the north Pacific in more than two years. The steel craft are to be 120 feet in length, 34 feet beam and 7.6 feet in depth. They will be used on the Columbia river, replacing wooden fuel barges now supplying the dredges MULTNOMAH and WAHIAKUM. About 4000 tons of steel will be required. Work will be begun in November and the contract provides complete delivery is to be made in 330 days.

The Union Steamship Co., Vancouver, B. C., has ordered a steel steamer from the Montrese shipyard in England. The vessel will be 225 feet by 37 feet and will have a speed of 15 knots. She is intended for service between Vancouver and Howe sound, B. C.

By a decision of the circuit court of appeals, the Patterson-MacDonald Shipbuilding Co., Seattle, has won another phase of its suit for approximately \$1,000,000 against the Australian commonwealth. This case is an aftermath of the war shipbuilding period. The Seattle company had a contract to build ten wooden steamships, each of 4200 tons deadweight for the government of

Australia. Later the contract was changed to provide that the last five hulls be completed with motor power. Nine vessels were delivered and the order for the tenth was canceled.

The Australian commonwealth sued the shipbuilders for \$1,040,110 alleging that the latter had broken the contract. The lower court ruled in the company's favor giving it a verdict for approximately \$1,000,000. It is this decision which has just been affirmed. During the litigation \$500,000 involved has been lying in Seattle banks. The court suits followed efforts to arbitrate, a board sitting for nine months finally finding in favor of the shipbuilders. Last year Patterson-MacDonald received \$420,000



SIR ALFRED YARROW

Famous British shipbuilder and engineer who for many years has been a leading figure in world marine affairs. He landed at New York in September for a business trip to this country and to Canada, where he also has a shipyard.

from the shipping board in settlement of its claims for cancellation.

The Hanlon Drydock Co., San Francisco, was awarded a contract for remodeling the steel steamer MERIDEN and converting her into a lumber carrier. The amount involved is \$45,242, work to be completed in 30 days.

At the plant of Todd Drydocks, Inc., Seattle, a steady run of work has continued during the last month. Contract for repairing the steamship ADMIRAL SEBREE, of the Pacific Steamship Co., was awarded on a bid of \$12,000. The work included renewing and fairing a number of plates damaged when the vessel stranded. Repairs costing \$30,000 were recently completed on the shipping board steamer WEST HIMROD. This freighter was pressed into service to carry relief supplies to Japan. The

WEST HIMROD has been idle for 18 months. On her last voyage, she was damaged in collision off Balboa and she was laid up without repairs. Other work done at this yard includes repairs to the Panaman steamer PAWNEE and Japanese steamer BELFAST MARU in addition to docking and overhauling a number of other large merchant vessels. During the week, the transpacific express liner PRESIDENT JEFFERSON was in port, following her arrival with refugees from Japan, a large repair gang from Todd's worked aboard making necessary voyage repairs.

The Willamette Iron & Steel Works, Portland, Oreg., obtained the contract for repairing the river steamer HERCULES damaged in collision with the shipping board freighter VINITA. The contract price is \$13,940, time 40 days.

One of the largest repair jobs awarded in recent months on the north Pacific went to Yarrows, Ltd., Victoria, B. C., which yard is now engaged in making the British steamship SIBERIAN PRINCE ready for service. The expense of salvaging and repairing the SIBERIAN PRINCE is between \$185,000 and \$200,000. She will be delivered to her owners within 60 days. She was damaged in late July when she stranded during a fog on Bentinck island, near Victoria. For several weeks she was thought to be a total loss but by persistent effort she was finally pulled off the rocks.

The steamer ADMIRAL GOODRICH, sold by the Pacific Steamship Co., to the National Steamship Co., is being converted into a lumber carrier at the yards of the Bethlehem Shipbuilding Corp., San Francisco, to whom the contract was awarded on a bid of \$3000. The Bethlehem yards, Los Angeles, are finishing a \$28,000 contract on the tanker DEVOLANTE and also repair work on the steel steamer ELABETO costing \$43,000, these two vessels having been seriously damaged in collision off the southern California coast.

EDWARD P. FARLEY, chairman of the shipping board, has been elected president of the Emergency Fleet corporation. The duties of Vice President SIDNEY HENRY have been broadened to include, in addition to the general supervision of the department of sales and finance, the administrative, statistical, personnel and investigation departments and the field forces. He exercises the duties and authorities usually performed by the general manager of a corporation. No change is made in the status or authorities and duties of Vice Presidents SHEEDY and KEENE, in charge of the operating and traffic departments, respectively.

World Unrest Cripples Shipping

Unsettled Political Conditions Dams Stream of Commerce
—British Shipping Passes Through Record Depression

BY CUTHBERT MAUGHAN
Shipping Editor, The Times, London

WRITING three months ago, it was pointed out that we were then approaching the period of the year which is normally the quietest for shipping, since the bulk of the great crops of the world had then been moved and the new crops were not available for transport. The outlook was far from bright. It was, indeed, very difficult to see any signs of possible immediate improvement. Conditions in the freight markets which, at the beginning of the year, gave considerable signs of promise, deteriorated steadily, and during the second quarter of the year extreme dullness set in. So, in a period of abnormal stagnation, the normal inactivity of the mid-summer months had to be faced. Unfortunately, the gloomy anticipation was proved to have been only too well justified. The experience of the past three months has certainly been one of the most unfavorable for the shipping industry within living memory and, in the view of many authorities, the most unfavorable that has ever been known. The present is normally a rather more satisfactory time in which to take stock of the shipping situation. We have now emerged from the ordinary period of summer quietness and are at the time when the ordinary movement of the crops usually begins to infuse life into freight markets. The fall, or the autumn, as it is called in Britain, is the time of the year when brokers expect to be most busy, and it naturally synchronizes with the return of most of them from summer holidays. Midsummer is the general holiday time for ship-brokers, because it is then that they can, as a rule, be best spared from their offices.

There are some signs now of the usual revival of demand for tonnage. It would be very serious, indeed, if there were now not some natural improvement, not merely for the shipping industry but for all the industries that are concerned with the production of the crops and for those

which are, in turn, dependent upon them. The crops have been grown and, unless they are marketed, heavy losses with far reaching results must be incurred. The point of immense interest to the shipping industry is whether the present practically un-

The greatest increase in tonnage is that of the United States which, on the same authority amounts to rather more than 10,500,000 tons.

The attitude of the broad-minded leaders of the British shipping industry toward this vast increase in the world's tonnage was one, again, of facing the facts. They remembered that the greater part of this tonnage had been called into existence by the necessities of the war, and that the construction of a great American mercantile marine was vigorously encouraged by British statesmen. The remarkable energy and skill with which so vast a mercantile marine was brought into existence aroused much admiration in Britain. So the hope of the British shipping leaders, as was publicly expressed on a number of occasions, was that those responsible for the management of the British and American ships should work together to develop the world's trade. In the earliest days of the return to peace,

it was publicly recognized that only by increasing the world's trade could there be any hope for the employment of all this vast tonnage. And the hope was not fantastical, since only by increased production could there be any possibility of replacing the immense loss of wealth during the years of war. Only by production will it yet be possible to replace the commodities which were blown to pieces without regard to the loss thereby inflicted on the world. But since the war there has instead of increased production been decreased output. Countries, and notably

Russia, which were contributing their share to the production of the world have, as far as international commerce is concerned, withdrawn for the greater part of the period entirely from the markets. The delicate mechanism of commerce which worked so smoothly before the war has been badly jolted and jarred, and today it does not run smoothly. The wheels do not revolve easily, if they revolve at all. They can not possibly run steadily and smoothly while they are subject to

British Shipping Index

PRICES OF REPRESENTATIVE SHIPPING SECURITIES IN THIRD QUARTER OF 1923

	Highest £ s d	Lowest £ s d
Securities		
Cunard £1 shares...	0 19 9 (July 2)	0 18 1½ (Aug. 1)
P. & O. deferred £100 stock	322 0 0 (July 23)	300 0 0 (July 11)
Furness, Withy £1 shares	1 13 3 (July 2)	1 6 3 (Aug. 27)
Royal Mail S. P. C. £100 stock	93 0 0 (July 2)	85 0 0 (Sept. 6)

SHIP CONSTRUCTION IN UNITED KINGDOM, THIRD QUARTER, 1923

	Gross tons
Tonnage launched	66,474
Tonnage commenced	111,860
Tonnage building, Sept. 30.....	1,271,195

SHIP MANAGEMENT FACTS IN THIRD QUARTER OF 1923

	Highest £ s d	Lowest £ s d
Time Charter Rates:		
Ordinary British steamers per ton dead-weight, per month.....	0 4 0	0 3 6
Voyage Rates:		
Plate—United Kingdom grain, per ton..	1 16 3	0 17 6
Australia—United Kingdom grain, per ton	1 15 0	1 15 0
South Wales—Buenos Aires coal, per ton	0 15 9	0 13 6
Chile—United Kingdom-Continent, nitrate per ton	1 12 9	1 8 6
Coal:		
Welsh bunker coal, two-thirds large, one-third small	2 10 0	2 5 0
Oil:		
Per ton at Port Said.....	4 5 0	4 5 0
Wages:		
A. B. seamen, per month.....	9 0 0	9 0 0
Firemen, per month.....	9 10 0	9 10 0
Assistant stewards, per month.....	8 5 0	7 10 0
Boatswains, per month.....	10 10 0	10 10 0

avoidable improvement will swell into a large demand or whether it will be but a fleeting inquiry after which the freight markets will again relapse into their previous condition of stagnation.

The only possible way in which business men can hope to trade is by facing the facts. One of the outstanding facts established during the last quarter is that on the authority of Lloyd's Register, the tonnage of the world is now greater by nearly 15,500,000 tons than it was in 1914.

the most violent jerks inflicted by the wildest movements of financial exchange. The fact has to be faced that the anticipations of increasing the world's production so that there would be means of using all the machinery that was forged during the war have not yet been realized. The disappointment is expressed in concrete form, in the fleets of idle ships which line the ports and harbors of the world, by rates of freight which barely cover the working expenses and frequently do not even go as far, and by millions of unemployed persons who are provided with the means of subsistence by those who are fortunate enough still to find work.

These conditions, unfortunately, it is not within the power of British shipowners to remedy. It is not even within the scope of British and American shipowners acting together to alter them. The causes lie beyond their control. It is not even in the power of business men combining together to change them. Politics are involved and when political considerations and public sentiment are concerned even business men whose natural instinct is toward compromise, find themselves unable to solve the problems. All they can do is to urge the need of the removal of obstacles to commerce and the necessity of a settlement. So British business men have watched the political developments on the continent with the closest interest and sometimes with the deepest concern, fully realizing that until conditions of real peace are restored and the world is again producing on a scale approximating more nearly to the maximum of its capabilities, commerce cannot flourish, and there can be no adequate employment of the shipping tonnage which is now waiting to be employed.

London's Markets Affected

London, as the nerve center of the British nations and, it is not too much to write, the business nerve center of Europe, has felt severely the dislocation of the world's commerce. There lie, close together, within a small area and in what is known as the City, the great exchanges where shipping tonnage is chartered, cargoes change hands again and again, consignments of produce from every quarter of the globe are bought and sold, insurances are effected, and banking facilities arranged.

The proximity of London to the continent and the fact that most ships, whether bound for London or the northern continental ports, pass up the English channel, has made it a

natural port of entry and a natural market. In the times before the war, dealers were accustomed freely to buy cargoes and consignments of commodities, knowing that there would be a market either in the United Kingdom which relies for the greater part of its foodstuffs and its raw materials for manufacturing on its imports, or on the continent. There were speculative dealings in the markets, but some speculation is essential to the health of markets. There were the dealers ready to buy supplies from the producers and themselves to take the risk of selling them. Thus were producers encouraged to send forward other supplies, and the stream of commerce rolled steadily on, circulating the produce of one country to the consumers of another and, again, the manufactures of the consumers to the producers of the raw material.

But lately some of the markets have been but ghosts of their former robust selves. Great movements daily in exchange made it impracticable for dealers to buy and sell freely as they had been accustomed. They knew by costly experience that all the profit they saw possible in a transaction might be wiped out by a sudden movement of exchanges, and heavy losses have been suffered in this way. Buying became of a hand-to-mouth character, and that is never sufficient to keep markets really prosperous. Peoples on the continent were known to be underfed, yet they were unable to buy the things they wanted. It has been said that never has there been so much second-hand office furniture in the City offered in such quantities and so cheaply as of late. Staffs have been reduced. The stream of commerce has been at a low ebb, and many firms have had the greatest difficulty in paying their way. With conditions such as these it is not surprising that business men have opened their daily papers each morning in the hope that they would read of some little indication of progress toward the re-establishment of stability on the continent.

The dwindling of commerce must have its effect on producers abroad and it has been shown in the difficulty of marketing commodities and in falling prices. The producer expects to receive an adequate price for his commodity yet often he is so much concerned with his own particular work that he does not stay to try to discover how it is that the prices he expects in return for his labor and the capital expended, are not forthcoming. The task of trying to find a means of straightening things out

has fallen in the main, on a few statesmen in Europe inspired by somewhat different principles. The great motive of England is peace because the only means she has of supporting her population is by overseas commerce and peace is essential to commerce. She is not, like the United States or France, largely self-supporting. She needs to import four-fifths of her foodstuffs, and she can only pay for these by exports of raw material of which coal is practically the only one of any importance, by manufactures, by rendering transport, and financing services, and by interest on investments abroad which, as the result of the strain of the years of war, have been very seriously reduced in amount.

Prosperity Is Interdependent

At the same time, while the thinking men of England know that the country must decline and be unable to support her present population if she cannot trade, it is fully recognized that there must be security on the continent for those countries whose frontiers are on the land. The possibility of the repetition of such a war as lately devastated the world, or a greater and more terrible war, must, if human forethought can prevent it, be avoided. The guiding principle of British business men has been that security should be guaranteed to nations and a way cleared for a real revival of commerce. They realize that the prosperity of one country is linked up with the prosperity of others, and thus, while they hope to see England again prosperous, they hope to see the populations of other countries likewise sharing fully in the prosperity of the world.

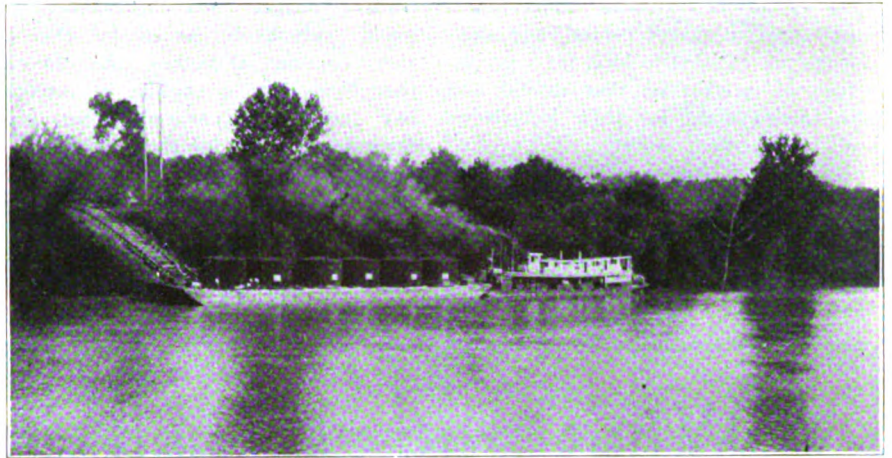
There is ample room for raising the standard of living of enormous numbers of the workers, but this can only come about when production is increased and prices automatically are lowered. It is far better for the world that there should be a large mass of goods available at low prices for all than that there should be a smaller quantity available at high prices for a few. Workers are naturally far less concerned with the amount of money they receive than with the quantity and quality of goods they can secure for what they do receive.

At the present moment, with some little revival of the demand to move the crops, there are also signs that a real improvement in conditions on the continent may not long be deferred. They have been slow to show themselves, although British statesmen have

labored strenuously to bring some order out of chaos. Russia is in international commerce gradually awakening after her long nightmare. It will in the opinion of men who know her well from a commercial point of view, be many years before she can again take a proper place in the business of the world, but it matters much that there are now signs of recovery, slow though the convalescence may be. Trade for years with Russia may be mainly on a barter basis, yet trade on primitive lines may be better than nothing and may lead to better things. It is certainly in the interests of the shipping industry that every country should take its own place in oversea trade. The shipping industry is concerned with transferring the goods of one country to another. Shipowners can do their share in helping to bring about an improvement by providing adequate transport facilities cheaply. It is their business to provide transport, and especially at a time when the supply of tonnage so much exceeds the demand, there should be no difficulty about that. Similarly if only for the same reason they will certainly be content with rates of freight that leave a very moderate margin of profit.

It is sometimes contended, I believe, in the United States that British shipping is worked at a low level of costs, but British shipping cannot be worked as cheaply as the mercantile marines of some of the continental countries. That is an established fact and the depreciation in foreign exchanges has increased the ability of some foreign owners to carry goods at rates below those of British companies. The effect of the depreciation of continental exchanges on shipping has been much the same as that which has made it possible for people to spend their holidays on the continent actually at lower costs than holidays at home.

The exceptional position of the foreign mercantile marines has aggravated the difficulty of British owners. In ordinary times vessels would in the late summer and early autumn proceed from Europe to North America in ballast, with a view to securing homeward cargoes of grain. At the beginning of September, it was reported that the only ships which had made such a voyage in ballast were foreign—Greek and Italian vessels—because their owners could run them more cheaply than British ships. Again an important railway company in South America has, in past years, been in the habit of importing its British coal in British steamers. This



SIX LARGE TANKS LOADED ON CUMBERLAND RIVER BARGE. IF HANDLED BY RAILROAD, THE TANKS WOULD HAVE HAD TO BE DISMANTLED

Barge Trip Simplifies Big Tank Shipment

Six large tanks made an unique water trip recently from the Old Hickory Powder plant, Jacksonville, Tenn., on the Cumberland river, to St. Louis on the Mississippi.

The large size of the tanks made it impossible to ship them by rail without first dismantling. Each tank had a diameter of 20 feet, a height of 12 feet, and weighed 13 tons. It was possible, however, to ship them in their original condition by barge.

The tanks were a part of the equip-

ment of the Old Hickory Powder plant and formerly rested upon a platform 20 feet high.

It was proved to be somewhat of a feat to get them from this position to the waterfront. They were first lowered by two locomotive cranes to flat cars, which hauled them to a point on a concrete road which crosses the plant. Here they were transferred to low wagons and hauled to the river by caterpillar tractors, the entire trip, a distance of a mile and a half being made six times without mishap. At the river front they were lowered to the barge on a special skidway without difficulty.

year 75 per cent of its supplies are known to have been carried in foreign ships because the rates accepted for these were lower.

In times of trade depression merchants, naturally enough, pay heed to the smallest differences in rates of freight, whereas when trade is prospering, they can afford not to be quite so careful and they will often be ready to pay a little more for the flag of their preference. Again when the demand for tonnage approximates more closely to the supply, shipowners, according to the ordinary law of supply and demand, are better able to secure the rates which they consider adequate.

Shipowners, as a rule, can justly claim that rates of freight represent no noticeable proportion of selling prices. Since they carry large quantities of goods in bulk the rates of freight represented as percentages of the prices at which goods are retailed to the public are, quite infinitesimal. Rates of freight, it may be stated broadly, never hinder commerce, and it is only the anxiety of owners to secure employment for their vessels in time of depression that forces rates downward to unduly low levels. Were

trade to be of ordinary healthy proportions owners would have no difficulty whatever in securing remunerative rates of freight. The small proportions of selling costs that freights represent were recently indicated by Sir Frederick Lewis, chairman of Furness, Withy & Co. He pointed out that in the case of exports from the United Kingdom to the United States or Canada, a distance of approximately 3000 miles, the cost of steamship transportation is only about one-seventh of a farthing per ton per mile and, similarly, that wheat was being carried from North America to the United Kingdom at about one-tenth of a farthing per ton per mile. No responsibility for trade depression can be laid at the doors of the shipping companies, and freights could be raised to a generally remunerative level without consumers noticing the slightest effect.

Shipowners, however, can only look forward to securing adequately remunerative rates of freight when commerce is again flowing between the countries in large volume, and, it is to be hoped that they will use every possible effort to try to influence the re-establishment of a healthier

state of affairs. Modern ships represent large outlays of capital, and ship-owners are entitled to look for a proper return of interest on that capital and also for payment for their knowledge and management ability.

Happily, of late years, in the United Kingdom, there has been a greater appreciation of the joint community of interests between merchants, bankers, insurance underwriters and ship-

owners, as has been expressed in the public statements issued by the various commercial bodies. An old idea that there was a conflict of interests has largely disappeared. That is a favorable augury for the future. Business men in the United Kingdom at any rate, are anxious to work together to develop the commerce of the world to the utmost, and they feel that the business men of the

United States are equally desirous of doing so.

The entire matter is now to a great extent in the hands of the politicians and the hands of these, in finding a solution, will be much strengthened by the knowledge that the leaders of business throughout the world are united in wanting a settlement and that they believe that therein lies the best hope of peace.

What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

CAMMELL, LAIRD & CO., Birkenhead, have completed and successfully tested the single screw diesel-electric vessel LA PLAYA for the United Fruit Co., Boston. This is the first of three electrically propelled vessels ordered from the firm in June last year. They are each 325 feet in length and 3830 tons gross and are designed specially for the carriage of bananas in tropical climates. A speed of 14 knots has been easily attained.

The principal feature of the vessels is their propelling machinery. This consists, in each vessel, of four generating units, each unit comprising a 4-cylinder Cammellaird-Fullagar internal combustion engine running at 250 revolutions per minute and directly coupled to a generator supplying continuous current at 220 volts for driving the propeller. The main generators are electrically coupled in series, and although all four are in operation at full power three, two or one may be used at reduced powers if desired. The adoption of four main generating sets insures economical running at reduced powers.

LOCKOUT of boilermakers by the Shipbuilding Employers' federation has continued 21 weeks. The boilermakers refuse to carry out a national agreement on night shift and overtime work signed on their behalf by the Federation of Trades, of which they were members and from which they have since been expelled by their fellow workmen.

The effect of the lockout has been to introduce a state of progressive paralysis in the shipyards. It is estimated the boilermakers themselves have lost in wages £40,000 per week and an additional 60,000 men are idle in the shipyards, engine and boiler shops or steel

works. It is believed that there are six men out for every boilermaker idle, and the estimated loss of wages, cost to the state, owing to relief, etc., is £150,000 per week or more than £3,000,000 to date. This is quite apart from the losses sustained by the employers through the loss of contracts.

FURTHER labor troubles are threatened, the Federation of Engineering and Shipbuilding Trades having decided to apply for an advance of 10 shillings per week. Lord Pirrie has stated on behalf of the shipowners that the existing contracts have been accepted practically without profit, and any rise in cost will bring numerous yards to a complete standstill.

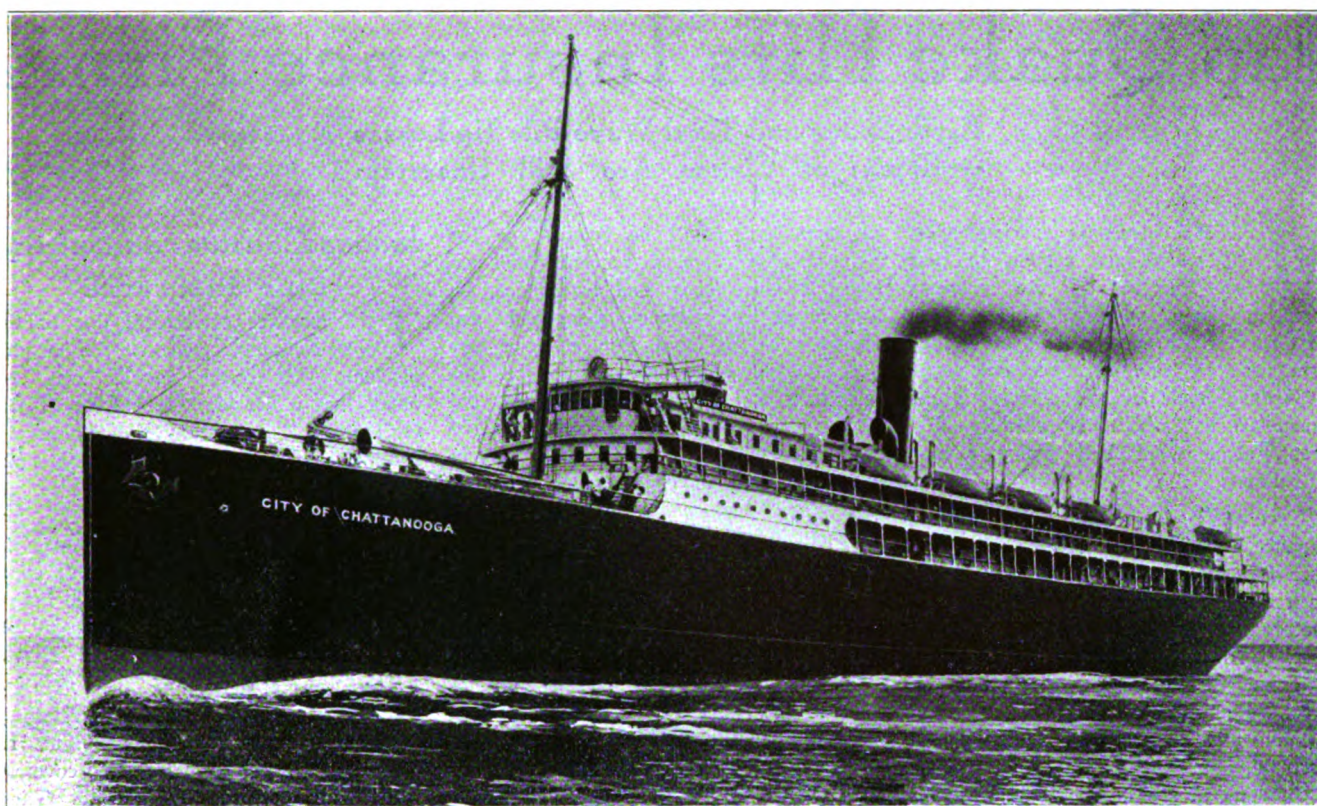
LORD WEIR addressing the Clyde Navigation trustees called attention in strong terms to the natural injury inflicted by labor stoppages and suggested that special measures should be taken to train boilermakers to take the place of those whose obstinacy is ruining the industry.

BRITISH admiralty has proposed to the workers' side of the Shipbuilding Trades Joint council the adoption of a system of payment by results in naval dockyards, and the men's unions concerned are considering the proposal. A special committee representing the employers recently reported that riveters employed on a warship on the time system handled 176 rivets per squad per week, whereas on payment by results 722 rivets were driven. A saving of 40 per cent in time was effected in connection with framing, and on two vessels built alternatively on the time and result systems, the latter was com-

pleted in 10 weeks as against 15 weeks on the time system. So far as the voting has proceeded, a large number of the men have expressed themselves unfavorably with regard to the change.

LORD ASKWITH, formerly a government official connected with the board of trade who figured prominently as arbitrator in great labor disputes, has written an article examining the industrial position of England today as compared with 1913. Dealing specially with shipbuilding, he points out that in April there was in Great Britain 33,500 tons more shipping under construction than in December. But the United States has lately been launching thousands of gross tons more than Great Britain. In 1919 the United States launched 340,000 tons against the British 135,000; in 1920 American 206,000 tons against the British 171,000. But in 1922, the corresponding figures were United States, 18,000. Great Britain 86,000 tons. In January this year, there were in America 4,625,000 gross tons of vessels idle, while in Great Britain the tonnage was 1,010,000 tons, a reduction of 9000 tons from the beginning of 1922. The writer deduces from these figures the conclusion that the shipbuilding industry and industries employing shipping are making a gradual recovery.

Nathan H. Frank, dean of the admiralty bar in San Francisco, and a lawyer of international prominence, died in San Anselmo, Cal., on Sept. 17. Mr. Frank gained international prominence through his knowledge of admiralty practice and procedure. He was born in San Francisco in 1858. He was a graduate of the University of California in 1877, and of the Columbia law college in 1879.



Fast steamer enters New York-Savannah run. Her sister ship will follow within a short time

New Liner Enters Coastwise Service

AT THE end of September, a new and interesting addition to the fleet of the Ocean Steamship Co., Savannah, Ga., the CITY OF CHATTANOOGA, arrived in New York. She was built by the Newport News Shipbuilding & Drydock Co. Plans and complete details of this ship and her sister ship the CITY OF BIRMINGHAM, will be found in the February, 1923, issue of MARINE REVIEW. The accompanying photograph shows the CITY OF CHATTANOOGA on her trial run. General characteristics of this new vessel are as follows:

Length over all, feet	401
Beam, feet	52
Displacement, tons	7180
Gross tonnage	6550
Freight capacity, cu. ft.,	323,500

Passenger Capacity

First-class	164
Second-class	40

The passenger accommodations incorporate many new and interesting features. The dining room is located on the hurricane deck forward and is fitted with small tables to accommodate two, four, and eight persons. A seat is provided for every first class passenger in one sitting. Stateroom accommodations for passengers are particularly fine. There are 10 suites de luxe each

with twin beds and private baths. In the decorations, five different color schemes are used. Eight additional suites consist of two and three connecting upper and lower berth rooms with private baths. Every stateroom throughout has hot and cold running water, electric fans, and vacuum bottles for drinking water. All bathrooms are provided with running hot and cold, fresh and salt water and with a shower over every tub.

In her public rooms, the CITY OF CHATTANOOGA is particularly attractive. A spacious and luxuriously furnished music room is located on the promenade deck forward, equipped with a reproducing grand piano and a laboratory model phonograph, both provided with extensive music libraries. The writing room is located on the promenade deck aft of the music room, and is comfortably and attractively furnished. On the boat deck aft will be found a sun lounge. Throughout all staterooms and public spaces, except the music room, which is carpeted, all floors are covered with tiling. The suites de luxe are tiled and also fitted with carpets arranged so that they may be removed during the summer months.

Cargo handling facilities have received particularly careful attention and fol-

low the latest and most up to date approved marine practice. An unusual feature is the increase of the height of the side ports, so that automobiles of the limousine or other standing top type may be passed through safely and expeditiously.

With her sister ship, the CITY OF BIRMINGHAM, the new CITY OF CHATTANOOGA represents the first additions to coastwise fleets since before the war. The CITY OF CHATTANOOGA sailed from New York for Savannah on her maiden voyage, Oct. 9, and when completed, her sister ship will enter the same service. The ships now running in this service and displaced by the new ships will be transferred to the Savannah lines Boston-Savannah service.

It is interesting to recall that during this period of a general slump in shipping the coastwise lines find business increasing and profitable. The trade is growing. To keep pace with the growth of the country the established lines between cities on the coast are bound to expand and prosper and additions to their fleet will be necessary. Improvements in design and appointment of coastwise passenger and freight ships will result and the future will see the finest class of ships luxuriously appointed and efficiently operated in these services.

Jap Quake Hits Insurance Firms

Earth Slides and Tidal Wave Pile Up Losses
—Extent of Claims Are Still Uncertain

MARINE insurance carriers, some of which are certain to bear the burden of the property losses in Japan, appeared interested in the terms of the earthquake proof policy form used by fire insurance companies in Japan. Some of the clauses in the marine form, which is entirely different, show what hull policy covers, as follows:

"Upon the body, tackle, apparel, stores, ordnance, munitions, artillery, boats and other furniture, boilers and machinery of the steamship called the —S.S. or by whatsoever name or names the said vessel is or shall be named or called; beginning the adventure upon the said vessel, etc., as above, and so shall continue and endure during the period aforesaid, as employment may offer, in port and at sea in docks and graving docks, and on ways, gridirons and pontoons, at all times, in all places and on all occasions, services and trades whatsoever and wheresoever, under steam or sail; with leave to sail with or without pilots, to tow and be towed, and to assist vessels and or craft in all situations and to any extent and to go on trial trips. With liberty to discharge, exchange and take on board goods, specie, passengers and stores wherever the vessel may call at or proceed to, and with liberty to carry goods, live cattle, etc., on deck or otherwise, but warranted free of any claim in respect of deck cargo. Including all risks of docking, undocking, changing docks, or moving in harbor and going on or off gridiron or graving docks as often as may be done during the currency of this policy.

"Touching the adventures and perils, which we the said assurers are contented to bear and take upon us, they are of the seas, men of war, fire, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, surprisals, takings at sea, arrests, restraints and detrainments of all kings, princes and peoples, of what nation, condition or quality soever, barratry of the master and mariners, explosions, riots or other causes of whatsoever nature arising either on shore or otherwise causing loss of or injury to the property hereby insured and of all other perils, losses, and misfortunes that have or shall come to the hurt, detriment or damage of the said ship, etc., or any part thereof and in case of any loss or

misfortune, it shall be lawful for the assured, their factors, servants, and assigns, to sue, labor, and travel for, in, and about the defence safeguard, and recovery of the said ship, etc., or any part thereof, without prejudice to this insurance to the charges whereof the assurers will contribute according to the rate and quantity of the sum herein assured. And it is expressly declared and agreed that no act of the insurer or insured in recovering saving or preserving the property insured shall be considered as a waiver or acceptance of abandonment."

This policy form is used by the American Hull Underwriters association. The policy used by the British carriers is very much similar to that of the American association. There is nothing in these forms exempting loss by earthquake or tidal wave. It is reported in London that several smaller crafts with heavy cargoes have been wrecked. No information has been received to the effect that large ships have been lost. This is substantiated by the reports that most of these large ships have been accounted for.

There are many Japanese insurance companies that operate locally transacting a marine insurance business, and in London, where the greater portion of reinsurance is carried. It is stated that some of these companies may not be in a position to pay their proportionate share of losses. As many marine policies cover warehouse to warehouse, or to some point on land, heavy losses are expected which will not result from only fire, but also tidal wave. While it is clear that none of the larger vessels was lost in Yokohama harbor, there is always a large amount of smaller shipping which could easily be destroyed. The large quantity of goods on piers and in go-downs could be lost.

There is doubtless a large quantity of goods still in warehouses under shore end cover and because of the general situation, marine insurance men in New York met recently and decided that there is likely to be considerable loss in the Japanese earthquake disaster under marine policies.

The New York board of underwriters appointed a committee to arrange to have competent salvage men on the grounds as soon as possible. It is expected that the majority of these will be drawn from ports near Japan.

Issues Caution on Surplus Line Insurance

THE market for surplus line or excess insurance seems to be steadily growing. Of recent date it was recorded that a considerable volume of this business is being transacted by certain groups of foreign insurance companies in this country. These companies, although not regularly licensed by any of the state insurance departments, are assuming many risks located in this country which are placed by brokerage houses and individuals operating mainly in the eastern section of the United States.

The representatives of these foreign companies are authorized to retain a certain percentage of the premiums received for such classes of coverage which are placed by them. These premiums are deposited with different banks in this country for the protection of the policyholders and are used in the payment of losses. State officials state that it is not a good practice to place insurance with such carriers because of disputes which may arise from losses occurring in this country and in such cases action would have to be taken up with the home offices of such companies. This often would mean a long delay in settlement. A superintendent of one of the state insurance departments recently issued a warning to policyholders in this country against having any dealings with companies of this kind.

* * *

Norwegian Firm Seeks More U. S. Business

THE Norwegian Atlas Insurance Co., Christiania, Norway, was established at its home in 1915, and entered the United States in 1918. It has been operating in this country under the management of the Northern Underwriting agency of which C. Steendal was the president. It has recently been officially announced that the management of the United States branch of this company has been transferred to Bjarne Holst. The notice which appeared in the press was signed by the new United States manager and Frederick P. Porter, associate manager.

Mr. Holst was sent to this country several months ago with full authority to take charge of the affairs in this country. In this country Mr. Holst is

not well known. Mr. Porter, his associate in the management, for the past two years, was a member of the firm of DeKay & Co., Inc., a brokerage firm. Mr. DeKay, president of DeKay & Co. has been retained in an advisory capacity by the new management of the Norwegian Atlas Co. Mr. DeKay has also been connected with the New York state insurance department for many years as an examiner in the workmen's compensation department.

This company is a by-product of the war and entered this country to transact a direct marine and fire reinsurance business. The fire reinsurance business was discontinued early in 1922.

At the present time there is only one Norwegian marine insurance company in this market; all others which were entered during the war and subsequent thereto have withdrawn, one of them being the Norske Lloyd, which was placed in compulsory liquidation. The Christiana General Insurance Co. is also a Norwegian company which operates only a fire reinsurance business.

The financial statement for the year 1922 of the United States branch of the Norwegian Atlas Insurance Co., as filed with the state insurance department of New York showed total assets of \$1,391,732, and net surplus of \$893,304.

* * *

More Ships Are Reported Lost in July

FIGURES compiled from the Liverpool Underwriter's association show that there were 435 vessels of over 500 tons gross reported as casualties for July of 1923. This compares with 429 vessels for July of 1922 and 364 vessels for July of 1921. Of these 16 vessels of 30,162 tons gross were totally lost as against 14 vessels of 31,767 tons gross for July of 1922 and 18 vessels of 29,291 tons gross for July of 1921.

* * *

Favor Steel Ships for Shipments of Steel

IN RECENT years cargoes of sheet steel from England to Norway have always been shipped in iron or steel ships. When cargoes of this kind are carried in wooden or composite ships underwriters should always cover the risks only with the F. P. A. clause.

Shipments on iron or steel ships are considered fairly good risks, but if such shipments are effected on steamers of another class they are considered very poor. Sheet iron is generally shipped in 100 kilo cases and stowed in layers beneath each hatchway. As the sheet iron is rather heavy it is evident that there

are large empty spaces in the holds and a ship can by no means be filled up with such cases. Cargoes of this kind may be to a certain extent compared with loads of gravel.

If these cases of sheet iron were carried in wooden or composite ships such vessels if encountering rough weather would have a heavy strain on the hull as well as on the deck and serious damage could then be expected. Therefore, it should be remembered in conservative underwriting the shipping of iron should be accepted only when placed on iron or steel ships.

* * *

Use Scrapped Warships in Jap Rebuilding

EXTENSIVE soundings are being made by steamers entering the harbor of Yokohama because of the recent upheaval of the sea bottom. In order that the true condition of the bottom of the sea may be known it is thought that it will be necessary eventually to make soundings as far out as 45 miles. Yokohama harbor, according to late advices, is still inaccessible to vessels with a draft equivalent to that of the Canadian Pacific line. Bankers and shippers recently requested marine underwriters of New York to have insurance policies or certificates of insurance amended to cover to the original port of destination or to any port in China or Japan to which goods may be diverted because of the possible congestion at the intended port of discharge. This is brought about by reason of reports which are being received in the United States that a great deal of congestion in Japanese ports is feared. Various steamship lines are now preparing to handle an abnormally large amount of freight and the Far Eastern conference has met to discuss the situation which has been brought about by the recent catastrophe.

The message from Osaka was given out to the effect that the navy department would soon begin scrapping a number of government vessels and in so doing obtain material to be used for reconstruction work in Tokio.

Reports of subsequent earthquakes have been received from various parts of the world; those of most interest to Americans being from Mexicali, lower California, where a fishing town is said to have been destroyed by a tidal wave. The town destroyed is San Jose de Cabo, which is just above San Lucas. A loss of life was reported at this place. Vessels carrying merchandise to Guayamas, which cleared the cape in time to escape damage or destruction, were ordered to return to San Jose de Cabo for relief work.

Chile Insurance Market Is Important

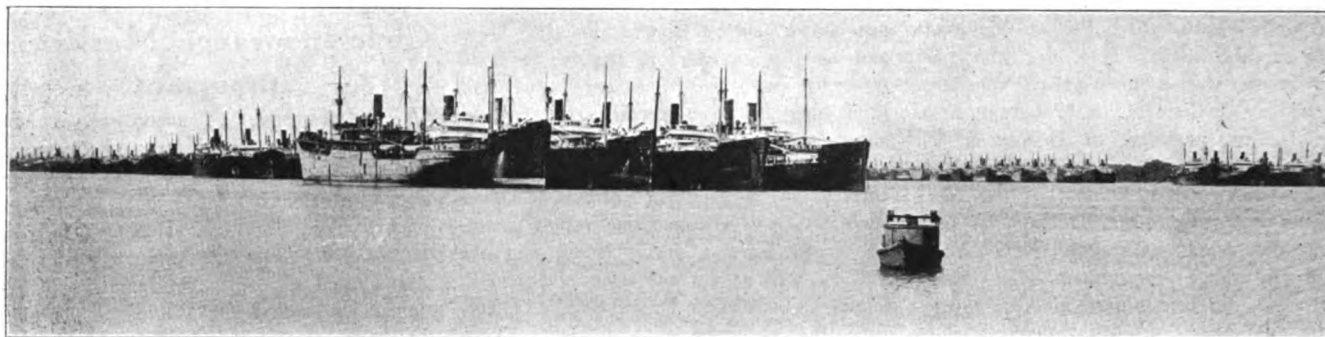
THE business of insurance is one of the largest businesses of the world today. The aggregate volume of turnover for the insurance companies now operating in the United States is \$3,500,000,000. The leading companies of the United States have formed an organization called the American Foreign Insurance association. The purpose of this organization is to facilitate the writing of insurance in outside countries. Each member of this organization assumes a certain portion of each risk written.

Chile is one of the countries in which not only American but French, British and German insurance companies have extended their writings. There is probably no form of business in Chile better developed than insurance. This statement is made by the department of commerce from the office of assistant trade commissioner Embry of Santiago. The insurance business of that country is progressing rapidly and is being placed on as sound a basis as that enjoyed in England and the United States.

The majority of insurance companies in Chile have their headquarters located in either Valparaiso or Santiago. Of the 131 companies which were entered in 1921 for writing insurance, 88 were located in the former city and 34 in the latter. Eighty-five of the aggregate number of companies were Chilean, while of the 45 others, 31 were English, 7 were German and 4 were American. Argentine, Canada, Brazil and Norway were represented by one company each.

The latest figures available show that during 1921 the premium income was in excess of 84,000,000 pesos, with fire insurance leading in importance, followed by life, marine, workmen's compensation, automobiles and vehicles, accidents to animals, accidents to persons, miscellaneous risks and earthquake insurance. Insurance of all kinds has steadily increased in Chile during the last 10 years and this is especially true of fire insurance.

A substantial increase was recorded in the amount of insurance handled by English companies in 1919 over the previous year. In 1920, a marked decrease was shown, undoubtedly the result of poor business conditions. American insurance companies while occupying an important although comparatively small position, in the premium volume manage to show an increase in business from 1918 to 1920 inclusive and during this period the number of American companies were increased from two to four. German insurance companies during the same period show an increase.



Part of the wooden fleet on the James river which is being steadily reduced by wreckers

Wrecked Wood Ships Yield Big Salvage

ONE of the many cross currents set in motion by the great war is now in full flood within the shadow of the nation's capital. Just across the historic Potomac river at Alexandria, Va., and in plain view of the city of Washington, workmen are tearing asunder hundreds of the wooden ships built under war time pressure.

This wooden fleet cost the people of this country \$300,000,000, but when the war ended and this government found itself burdened with ships that never could be used in commerce there was only one of two things to do: Either let these ships rot at their moorings or sell them to a company that would dismantle them and place the salvaged material in the ordinary channels of trade. The latter course was pursued.

Ever since the end of hostilities, the wooden vessels have been anchored at Claremont, Va., far enough up the James river so that they would not be ravaged by marine borers. These

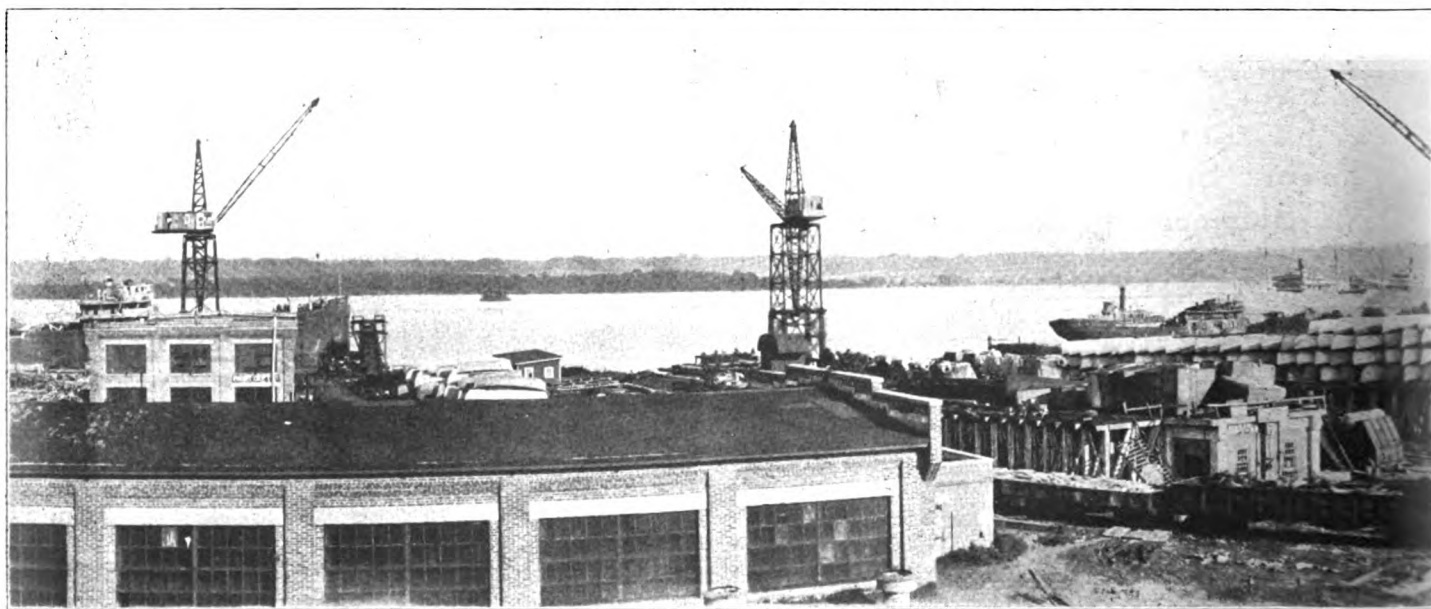
ravagers can not live in fresh water, so the safety of the wooden fleet was sought by mooring it outside the ranging area of these salt-sea freebooters.

Six or seven years ago, the quiet old city of Alexandria awoke to the fact that once again she was a center of active war time preparations. Ships were being built by the Virginia Shipbuilding Corp. Today, these same shipyards, after an interim of idleness and neglect, are again harnessed for active service. But the equipment is used to tear apart rather than put together.

The Western Marine & Salvage Co., San Francisco, purchased nearly 300 ships from the shipping board for \$750,000, and now is busily engaged in tearing the vessels to pieces and selling hundreds of thousands of items of all kinds, nautical equipment, mariners' supplies and ship fittings that are salvaged from the big boats. Every mechanical device known to the sea-

faring and ship-wrecking industries that is efficient in demolition, is being employed to expedite the work for it is just about as complicated and difficult a proposition to destroy one of these wooden vessels as it was to build.

The terms of sale were that the ships were to be accepted "as is, where is." They were to be dismantled as rapidly as possible and they were not to be used for transportation purposes. The wrecking activities have now been in progress for many months and about 80 of the vessels have already been dismantled. The manager of the demolition operations estimates that it will take about 14 to 16 months longer to complete the salvage enterprises and to sell all the stocks of redeemed equipment. Operating at peak capacity, his shipwrecking crews are able to dismantle one of the boats in two days. The wrecking of two to three vessels a week represents a good six day's work. Two of the

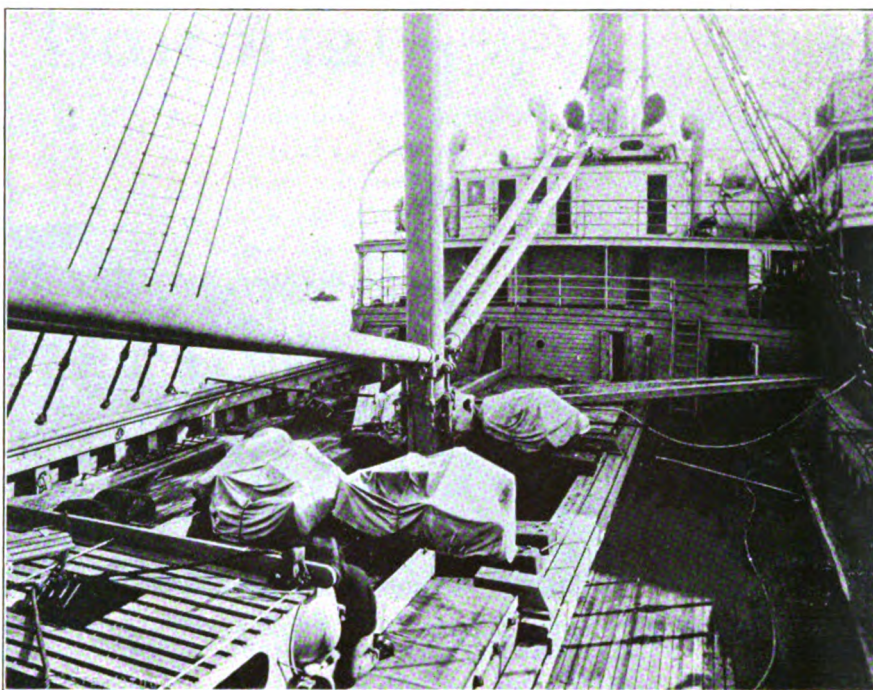


GENERAL VIEW OF YARD AT ALEXANDRIA, VA. AN AVERAGE OF TWO TO THREE SHIPS

ships at a time are towed up the James and Potomac rivers by tugs to the Alexandria plant, which is just large enough to accommodate 10 of the wooden vessels at a time. It takes a crew of 100 men to demolish the vessel and to save all available parts and equipment.

The magnitude of this extensive ship dismantling enterprise is reflected in the amounts of salvaged material that the wreckers hope to rescue. It includes 200,000 tons of scrap iron and steel, 12,000,000 feet of cable wire, 100,000,000 feet of southern pine and western fir lumber, 64,500 feet of steamship smoke-stack, 5000 tons of brass and copper, 2500 miles of galvanized pipe, 2260 steam pumps, 9000 tons of water tanks, 5000 drill presses, anvils and vises, 1800 steam winches, 12,000 steam and air gages, 5500 tons of anchor chain, 600 tons of rope, 162 engines of 1400 horsepower each, 6 turbine engines, 226 brass condensers, 452 watertube boilers, 17,000,000 bolts and washers of all knids and sizes, 430 propellers, 226 bronze-mounted cannon for shooting life lines, 1140 miles of electric wire, 522 bronze gongs, 1500 oak desks, 226 large galley ranges (with all the complement of cooking utensils, dishes, silverware and similar supplies) as well as 20,000 oars, 600 lifeboats, 20 carloads of canvas and 8000 life preservers. All of this equipment is among the best that the country could produce.

Among the most useful agencies of destruction that are used is the acetylene torch, which is used in cutting through metal columns and supporting braces in order that the iron and steel work may be removed from the decks and hulls. After the metal appliances



DECK VIEW OF TYPICAL FERRIS TYPE WOODEN FREIGHTER AWAITING THE WRECKING CREW

and machinery are loosened from their anchorages by use of the acetylene torches, they are hauled from ship to shore. All portable equipment and accessories are hauled to satisfactory storage places in the old shipbuilding plant. Then gasoline drag saws are used to cut away the decks and all other removable wooden sections.

Finally, all that remains is the wooden hull with such a network of bolts and nuts, spikes and tie rods, that it can not be sawed to pieces. The hull is then ready to be hauled ashore and burned in order that all metal used in its construction may be salvaged from the ashes by powerful

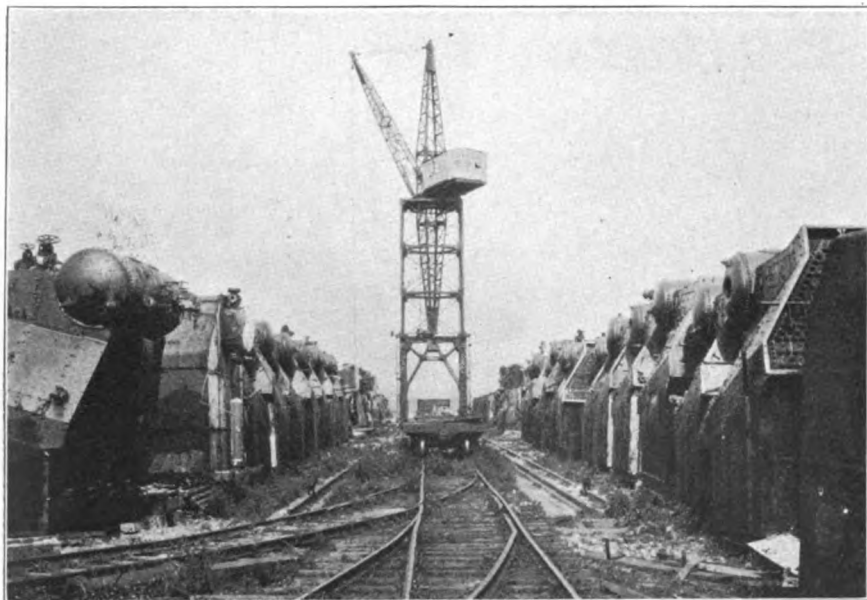
swinging magnets of large capacity.

The hulls of the ships that have been dismantled are now being towed down the Potomac river to an anchorage below Mount Vernon to await burning. The hulls as they stand today make excellent scows and barges, and efforts are being made to market them for such purposes. Another possible disposition of the hulls will be as bulwarks along the waterfront of river reclamation projects. They would furnish a continuous frontage about ten miles long and could be sunk by weighing them with sand and thus used as the basis for filling in new land.

Many of the country's leading in-



ARE BEING DISMANTLED EACH WEEK AND EVERY WORTH WHILE ITEM SALVAGED



BOILER STORAGE YARD, UNITS ALL SALVAGED FROM WOODEN SHIP FLEET
AT ALEXANDRIA WRECKING YARD

dustries are prominent buyers of the wooden fleet materials. All articles such as steam gages, water gages and indicating instruments are conveyed to the instrument house, where expert mechanics repair them. They are then sold to maritime concerns for installation on ships. The pumps, refrigerating machinery, winches and all other auxiliary equipment are also repaired or cleaned by experienced workmen and then sold to trades and industries in all parts of the country. Equipment that can not be repaired is taken to pieces and certain parts are retained as "spares," while the rest is reduced to junk.

A big merchandising organization has been developed at Alexandria, and it is selling the salvaged machinery to builders and contractors, mines, quarries, and shipbuilding companies, and other industrial agencies both along the Pacific and Atlantic seaboard and inland. Some of the material is being used as new equipment or repairs on boats that ply the Great Lakes. The wrecking authorities have exerted every effort to salvage each piece of useful equipment and direct it back into channels where it will be most effective. So far, they have sold all the material as soon as it was ready for shipment. If this successful marketing continues, the enterprises of salvage and sale will conclude about the same time, in a year and a half.

T. STURGIS BARNES, formerly assistant sales manager at San Francisco for the Bethlehem Shipbuilding Corp., has been transferred to San Pedro, Cal., as sales manager. Mr. Barnes has been with the company for 12 years.

September Ore Shipments

Iron ore shipments from the Lake Superior district in September were 9,095,981 gross tons. This is a million ton drop from the record totals set in July and August, but is more than 2,000,000 tons greater than the total carried in the corresponding month last year. The total up to Oct. 1 as well as last month's record by ports is shown in the following table:

Port	1923	To 1923
Escanaba	569,060	4,564,527
Marquette	342,643	2,120,986
Ashland	1,050,443	5,199,694
Superior	2,744,199	13,751,785
Duluth	3,486,943	15,310,275
Two Harbors	902,693	5,041,578
Total	9,095,981	45,988,845
1923 increase	2,294,682	12,877,607

Lake Michigan Receipts

In September, 1,972,034 tons of iron ore were delivered at Lake Michigan ports making a total of 9,092,307 tons up to Oct. 1. Details follow:

Port	Gross tons
South Chicago, Ill.	1,033,139
East Jordan, Mich.
Boyne City, Mich.
Milwaukee	17,890
Indiana Harbor, Ind.	293,630
Gary, Ind.	627,375
Total	1,972,034

CAPT. CHARLES CLARKSON, recently master of the shipping board steamer WEST MAHAWA, has been named manager of the North Coast Stevedoring Co., Seattle, succeeding R. A. CLARK, resigned.

GEORGE T. VEDELER, recently appointed vice consul for Norway, has assumed his duties at his office at 18 Oliver street, Boston.

Lake Erie Receipts

Ports on Lake Erie received 6,792,847 gross tons of iron ore in September compared with August receipts of 7,942,307 tons. In September last year, the receipts were 5,456,476 tons. Total receipts to Oct. 1 are 34,126,491 tons. Details are:

Port	Gross tons
Buffalo and Port Colborne.	807,121
Erie	183,831
Conneaut	1,447,643
Ashtabula	1,659,019
Fairport	352,687
Cleveland	1,364,268
Lorain	527,970
Huron	177,838
Toledo	170,209
Detroit	102,261
Total	6,792,847

Pittsburgh River Traffic

Freight tonnage moved on the rivers in the Pittsburgh district dropped from 3,023,820 tons in August to 2,644,914 tons in September. In the like month last year, the total was 2,164,830 tons. The September record follows:

Commodity	September, 1923			Total, short tons
	Allegheny river, short tons	Monongahela river, short tons	Ohio river, short tons	
Coal	63,926	1,542,833	367,007	1,973,766
Coke	0	33,247	0	33,247
Gasoline	1,260	1,620	0	2,880
Gravel	97,845	91,184	80,908	269,937
Packet cargo	0	0	6,157	6,157
Sand	108,595	117,272	98,730	324,597
Steel products	0	18,256	11,390	29,646
Unclassified.	740	2,994	950	4,684
Total	272,366	1,807,406	565,142	2,644,914

The bureau of standards, Washington, is about to undertake an investigation of the possibilities of using nondestructive methods for testing wire rope with special reference to hoisting rope. Present methods of inspection are unsatisfactory and do not unfailingly tell when it is necessary to remove the rope from service. The object of this investigation is to develop, if possible, some method by which an actual test can be made to determine the condition of the rope with respect to its deterioration in service, without destroying it.

A new high power signal has been developed for use on small ships. This is claimed to have advantages in greater carrying power or audibility and also in requiring only one-tenth of the volume of air usually needed. For this reason, decreased space is used for air storage.

George Twigg Jr., Needham, Mass., a recent graduate of Boston university, has joined the Boston office of the bureau of foreign and domestic commerce as commercial agent.

Editorial

Cutting Down the Repair Bill

EVERY ship carries in its toolroom and engineer's stores, the tools, materials and selected spare parts for making ordinary and emergency repairs. The larger and more important a ship is the more elaborate is this equipment, even to the extent of a carefully fitted out small machine shop with a more or less complete line of regular machine tools.

One of the important items in the greater cost of operation of American ships as compared with foreign ships has been and continues to be the large expenditure for what is known as voyage repairs. These are repairs needed by the ship on her return to port which the crew either were unable to accomplish at sea or in port or work of the nature which they have become accustomed to look upon, even though they might be equipped to do it, as not within their scope of duty.

In looking into the underlying causes for this condition it may be well to consider first the foreign flag ship. The training for young men wishing to follow the sea as prospective engineers in the marine countries of Europe begins on shore in a fixed apprenticeship qualifying them as skilled machinists in the process of building and erecting marine engines and auxiliaries.

The apprenticeship is deliberately planned and modeled to cover as fully as possible a thorough practical knowledge of how marine machinery is built and functions, to become acquainted with good practice, to appreciate the great wear and strain to which certain parts are subjected, to learn care in operation, to minimize trouble and to apply skill and ingenuity in making permanent repairs whenever the nature of the breakdown permits. The young prospective engineer then goes to sea, skilled as a mechanic and begins his practical sea-going experience under the discipline of a chief engineer and assistants who have already enjoyed in addition to similar shore experience, years of duty at sea. He joins an atmosphere where it is considered a reflection to have breakdowns and a disgrace to require help of shore repair yards except for breakdowns of a nature clearly beyond the repair facilities of the ship.

The situation in the American merchant marine is different. In native ingenuity, skill and energy the young American who sets out to follow the sea is on a par if not superior to the best of other nations. If this is not so, the American merchant marine is doomed to failure. It can not be admitted for a moment that the man power itself is not as good, but unfortunately other conditions seriously affect efficiency. There is rather

a drifting at haphazard into the marine service instead of entering it by means of a definite and clearly defined mode of procedure.

A certain length of service on board ship as an oiler or junior engineer and general educational requirements will qualify a man for examination to a licensed grade. No training as a mechanic is required. All training along this line is obtained incidentally in making any necessary repairs to the machinery he is learning to operate. Under these conditions then, the average American engineer is not so well equipped to carry on the more difficult repair work.

The inducements for Americans to go into the merchant marine have been and are proportionately much less than in the case of foreigners on account of the greater opportunities ashore. Following the progress of the war the tremendously rapid growth of the merchant marine called into the service a large personnel poorly trained and equipped. Owing to the shortage of good men, discipline and standards of performance dropped.

Since the return of shipping to normal, experienced operators have attempted to eliminate expense and increase efficiency. Particular efforts have been made to reduce voyage repairs by insisting that nothing be requested that the crew could do at sea or in port and enforcing this rule by making their jobs depend on the degree of care and skill that they showed in the operation of their ships.

The degree of success of these efforts to establish American shipping on a solidly efficient basis is one of the important factors entering into overseas competition against foreign ships. Owing to the conditions set forth above the American ship owner is somewhat handicapped in this effort. To correct any situation it is best first to face the issue squarely.

The American marine officer and prospective officer needs to take careful stock of the situation in the marine field and come to the realization that a considerable part of the responsibility of making the American merchant marine a success rests on him. All worth while men whether they were born Americans or swore allegiance in becoming citizens will work for the best interests of their country. No American worthy the name who would not resent the insinuation that he could not hold up his own with the men of other nations. It is necessary, therefore, that aroused ingenuity, energy and firmness of purpose should raise American personnel to a par and above that of the foreign merchant marine in the performance of its duties efficiently.

Quick Way To Find Fuel Costs

Original Graph Carefully Plotted To Show at a
Glance Comparative Fuel Costs of Coal and Oil

BY A. H. JANSSON

EVEN 10 years ago, oil as fuel under boilers in ships was considered a novelty. Coal was the universal fuel for ships all over the world and experienced marine engineers, always inclined to be conservative, did not look with favor upon proposals that boilers be equipped to burn oil. Much stress was laid upon the danger from fire and explosion and the questionable success of the oil burners offered. In the interval, however, practically all prejudice has been overcome. Oil burning equipment has been developed to an extraordinary degree of efficiency. Experience in burning oil is considered a necessary qualification for any marine engineer. Though the big liners which were completed before the war came out as coal burners they have now practically all been converted to burn oil. Oil is now definitely established along with coal as a conventional fuel for producing steam.

Going into the original reasons for using oil instead of coal, it is obvious that the following factors had a determining influence.

1. Economy; under this general heading are included,
 - (a) Greater heating value per unit of weight.
 - (b) More nearly perfect combustion, giving increased boiler efficiency.
 - (c) Saving in space and weight for the fuel necessary to cover the same distance, or increased steaming radius for the same bunker space.
 - (d) Saving of labor in the fire-room in stoking and trimming.
 - (e) A direct saving in the cost.
2. Ease and cleanliness of bunkering.
3. No handling of ashes.
4. No grates.
5. Easier to maintain a steady pressure of steam, and elimination of fireroom crew difficulties.
6. Easier to force the boilers in an emergency, which practically amounts to increased boiler capacity.
7. No possibility of spontaneous combustion.

Certain obvious disadvantages do

exist, however, and they may be enumerated as follows:

1. Somewhat increased fire and explosion hazard.
2. Extra initial expense, in oil burners, pumps, heaters, oil suction and discharge lines, steam coils or other means used for liquifying the oil in cold weather so that it can be pumped.
3. The periodic cleaning out of tanks to remove residue or for repairs.
4. Coal generally is easier to obtain, particularly in out-of-the-way places.

The sum total of advantage unquestionably lies with oil as a fuel in preference to coal and the great majority of steamships recently built and practically all now building are equipped to burn oil. Careful owners and operators, realizing the serious disadvantage of being dependent on oil alone for fuel, have taken the precaution to carry on their oil burning ships a full line of coal burning furnace fittings and have arranged bunker requirements so that should there be a sufficient change in the relative costs of fuel oil and coal, a change to burn coal can be made on short notice. In some cases the time required to make the change is said to be only one half hour. The most serious difficulty in making the change to coal is in arranging adequate bunker spaces. Naturally the double bottoms for carrying oil cannot be used. Deep tanks may be used if they are provided with plated openings leading to the fire room. Such openings in the deep tanks are not customary in ships burning oil. Coal could also be carried in the after end of the cargo hold adjacent to the fireroom with a bolted plate access door in the bulkhead.

Though quite a number of oil burning ships are equipped to make the change to coal and practically all could be so equipped in a comparatively short time, the change from oil to coal is seldom made. Once an oil burner always an oil burner seems to be the order of the day.

It is for the purpose of pointing in a graphic way to the really startling increase in fuel costs which re-

sult when there is a variation in price of fuel oil and coal, that the accompanying insert chart has been prepared. Operators may know that oil has gone up and coal has come down without definite figures showing the difference in fuel costs. From the chart it is possible, taking the current quotations on fuel oil and coal to see at a glance what these quotations mean in fuel costs.

Derivation of Chart

Above in the enumeration of the original reasons for introducing the use of fuel oil on ships under the subheading "e" was noted "a direct saving in cost." At present quotations on fuel oil and coal, this condition has been reversed. There is instead a considerable increase in cost. Advantage of fuel oil over coal as listed in items "a" and "b" however, are permanent. In calculating the fuel costs used for the preparation of the chart these two conditions have been taken into account. The other advantages of fuel oil over coal cannot, of course, be taken into account in the diagram and must be considered separately on their merits in determining whether or not a change to burn coal would be advisable.

The following assumptions are made for the calculations on which the chart is based

1. Good bituminous coal at 14,400 B.t.u. per pound.
2. Good fuel oil, about 16 degrees Baume, specific gravity 0.959, at 18,800 B.t.u. per pound.
3. Boiler efficiency with coal, 67 per cent.
4. Boiler efficiency with fuel oil, 75 per cent.

From the above assumptions

$$\frac{18,800}{14,400} \times \frac{75}{67} = 1.46$$

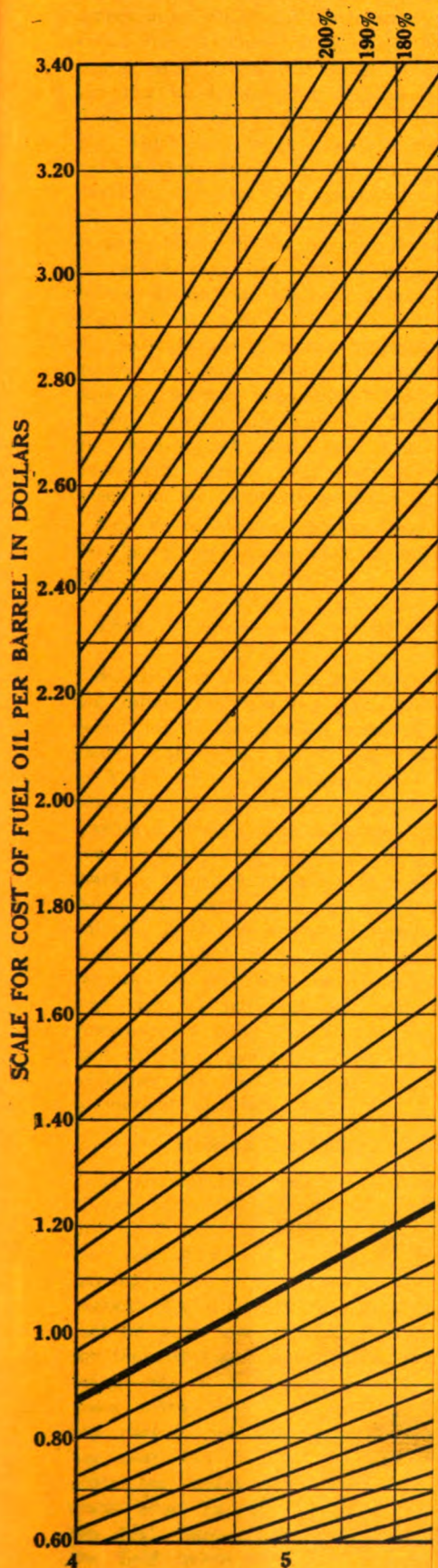
That is, 1 pound of fuel oil is equivalent to 1.46 pounds of coal.

Weight of 1 barrel of above fuel oil=336 pounds.

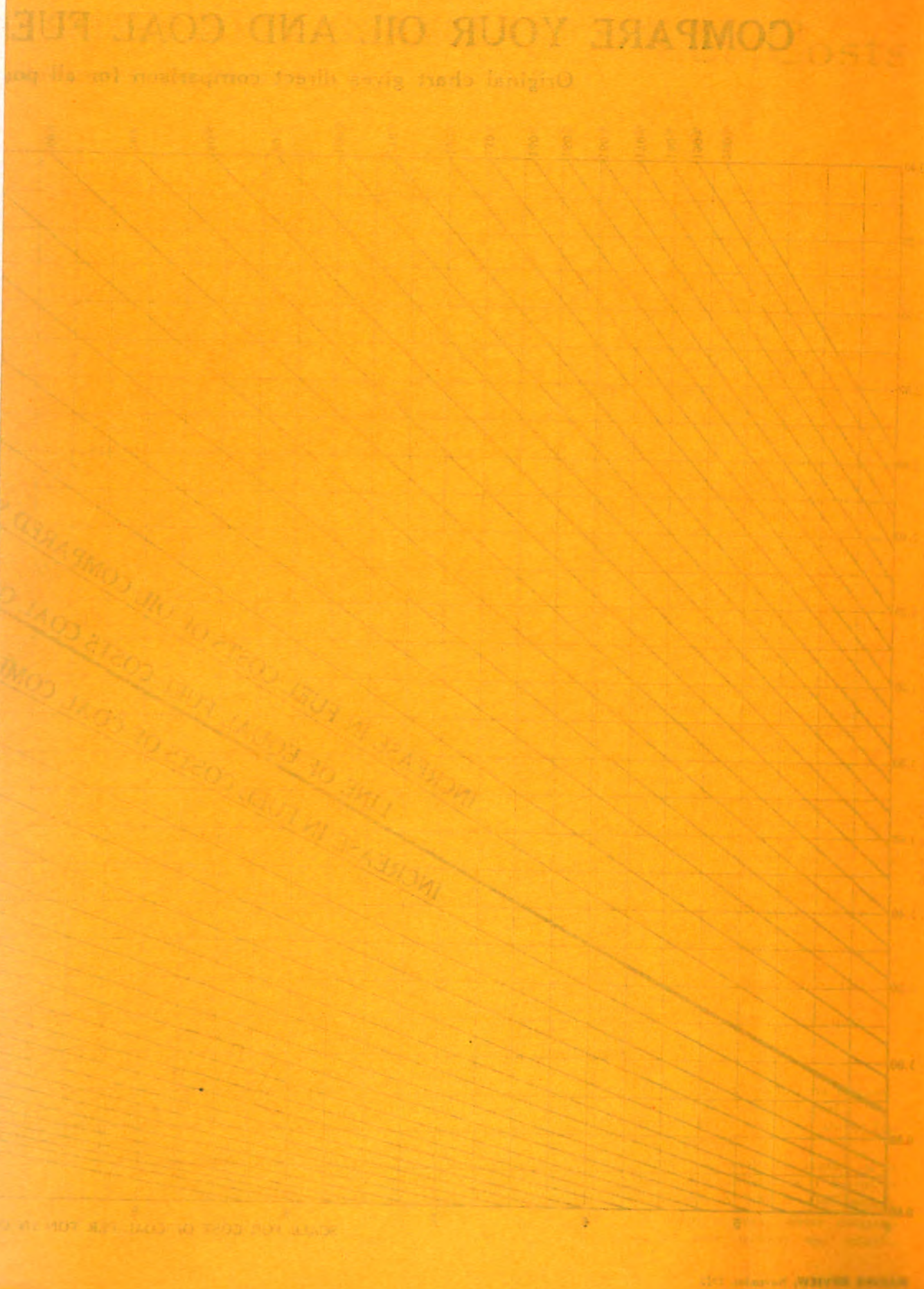
Weight of coal as above, of a heat value equivalent to 1 barrel of fuel oil=336 X 1.46 = 490.5 pounds.

In order to make direct comparisons at once without any calcula-

COMPARISON



MARINE REVIEW, November, 1923



tions, prices per the units which are in general use in quotations on bunker fuel oil and coal have been used. The vertical scale gives the cost of fuel oil per barrel in dollars and decimal fractions, each major division representing \$0.20 and each small division representing \$0.10. The horizontal scale gives the cost of coal per ton in dollars and decimal fractions, each major division representing \$1.00 and each small division representing \$0.25. It is, therefore, possible to plot the cost of fuel oil or of coal with reasonable accuracy almost to the penny. A similar graph may be made with larger scales giving as high a degree of accuracy as may be warranted by the basic accuracy of the assumptions made. A simple algebraic equation may be written representing the relation between the cost of fuel oil per barrel and coal per ton for equivalent steam producing values, based on the assumptions noted above.

Let Y = cost of bunker fuel oil per barrel and X = cost of bunker coal per ton.

$$\text{Then } Y = \frac{490.5}{2240} X = 0.2189X$$

Substituting for X in this equation, the different prices per ton of coal noted in the horizontal scale of the chart, that is \$4, \$5, \$6 and so on to \$14 corresponding values of Y are obtained. As the above equation represents a straight line only, two spots are necessary for drawing the line marked zero per cent on the graph. Additional spots were, however, calculated as a check for purposes of accuracy. The above equation represents the condition where the fuel costs for oil and coal are equal and consequently there is for this condition neither a gain or loss in the use of either fuel and therefore this line is marked zero per cent.

How to Use Chart

As an example, suppose coal costs \$7 per ton, following up the vertical line at 7 until it intersects the zero per cent line and from this point moving over in a horizontal to the vertical scale it will be noted that fuel oil must sell at \$1.53 per barrel for the fuel costs of producing steam, using oil, to be equal to the fuel costs using coal. In the chart, in any part of the field above the zero per cent line, or line of equal fuel costs for steam produced, the fuel costs using oil will be greater than the fuel costs using coal, while in the field below this line the conditions will, of course, be reversed.

In order to divide off these respective fields into convenient lines showing quantitative increases in fuel costs of one fuel over the other, a modified form of the above equation can be used. For instance, to determine the line which represents a 10 per cent increase in fuel costs of coal over oil. In this case

$$1.1 Y = \frac{490.5}{2240} X = 0.2189 X$$

$$\text{or } Y = \frac{.2189X}{1.1} = 0.199 X$$

Substituting as before different values of X (cost per ton of coal) from 4 to 14, corresponding values of Y are obtained and the straight line marked 10 per cent, lying below the zero per cent line can be plotted and drawn. In exactly a similar manner the equation for the line which represents a 200 per cent increase in fuel costs when coal is used instead of oil may be written as follows:

$$3.00 Y = 0.2189 X$$

$$\text{or } Y = 0.073 X$$

Substituting values of X , corresponding values of Y are determined and the straight line marked 200 per cent lying in the field below the zero per cent line can be plotted and drawn. Lines representing every 10 per cent increase from 10 per cent to 200 per cent were thus plotted.

To plot similar lines showing percentages of increase in fuel costs of oil over coal, in the field above the zero per cent line the following examples may be given.

For the line representing a 10 per cent increase

$$Y = 1.1 (0.2189X) = 0.2408 X$$

And for the line representing a 200 per cent increase,

$$Y = 3 (0.2189X) = 0.6567 X$$

Substituting values of X , corresponding values of Y are determined and the lines marked respectively 10 per cent and 200 per cent lying in the field above the zero per cent line may be plotted and drawn. In the same manner lines representing every 10 per cent increase from 10 per cent to 200 per cent were plotted.

To determine the effect of the basic assumptions on the results obtained for plotting the lines of percentage increase in fuel costs on the chart, the following conditions, more favorable to coal and correspondingly less favorable to fuel oil, are taken:

1. Good bituminous coal at 14,500 B.t.u. per pound
2. Good fuel oil about 16 degrees Baume, specific gravity 0.959 at 18,600 B.t.u.

3. Boiler efficiency with coal, 68 per cent.

4. Boiler efficiency with oil, 75 per cent.

Then,

$$\frac{18600}{14500} \times \frac{75}{68} = 1.415$$
 that is, 1.415 pounds of fuel oil is equivalent to 1.415 pounds of coal, and the ratio between the original factor and the one just computed will be

$$\frac{1.46}{1.415} = 1.03$$

From this it will be noted that the fuel costs of equivalent amounts of oil in place of coal will be 3 per cent greater than shown in the chart, while in the region where fuel costs for oil is less than for coal, the fuel costs of equivalent amounts of coal will be 3 per cent less. Actually then for conditions more favorable to coal than those assumed for making the chart, the field in which oil is superior to coal will be less than shown while the field in which coal is superior to oil in fuel costs will be greater than shown.

As examples for using the chart, assume first that the following quotations on fuel delivered in the ship has been received.

Fuel oil per barrel \$1.40.

Good bunker coal per ton \$7.05.

Following the vertical line in the chart at \$7.05 to its intersection with the horizontal line representing fuel oil at \$1.40 per barrel, this intersection falls on the oblique straight line marked 10 per cent. This line is below the zero per cent line and consequently represents the increase in fuel costs for steam produced, if coal is used in place of oil at the above quotations.

How Present Prices Compare

Now, taking the actual present market quotations for ships, bunkers in New York,

Fuel oil per barrel, \$1.66½.

Bunker coal per ton, \$6.25.

Entering the chart at \$6.25, the point of intersection with the horizontal line representing \$1.66½ per barrel, falls slightly above the oblique straight line marked 20 per cent in the field above the zero per cent line, and by interpolation this point represents about 21 per cent increase in fuel costs for the steam produced when fuel oil is used in place of coal at present market quotations in New York.

How seriously such a condition of affairs affects the operating costs of

(Concluded on Page 425)

Safety Factors in Lake Ships-II

How Shifting of Iron Ore and Wheat Cargoes Would Affect Large and Small Vessels

BY ANDERS LINDBLAD

NEARLY all the cargo transported by the lake freighters is carried in bulk. It is loaded into the vessel entirely by machinery and is almost never hand-trimmed. Owing to the limited draft of 19 to 20 feet and the comparatively high density of most of the cargoes, such as ore, coal, and grain, the cargo holds can not, as a rule, be entirely filled at the available draft. Even when lighter cargo is carried, such as oats, and barley, there will always be empty spaces of the hold up in the corners of the deck at the sides unless hand trimming is used. It is obvious that in a vessel only partly filled with cargo there is a probability, when she is rolling, that a part of the cargo may shift and cause a dangerous heel of the vessel. For ocean going ships, different governments have issued regulations regarding the precautions which have to be taken to safeguard vessels when loading grain and other cargoes which are likely to shift. In the Great Lakes district no such regulations are in force; and, as far as I am aware, no precautions are taken in this respect. It is, therefore, of interest to investigate to what extent a possible shift of cargo may affect the stability of these vessels. To this end, calculations were made for the same vessels for which the wind effect was investigated. Fig. 7 gives the results for a vessel 590 x 64 x 33 feet loaded with iron ore. Curve *A* represents the righting lever of the displacement from keel (*KN*). Curve *B* gives the arm of the moment of the weight (hull+cargo) in the case where the cargo has shifted and occupies the space bounded by the line *B* as indicated in the section. This condition is on the assumption that the cargo is piled up as far out to the side as possible maintaining an angle of repose of 35 degrees. It is, however, extremely unlikely that a cargo of iron ore really could be shifted to such an extent even under the worst weather conditions.

Curves *C* and *D* represent the weight

moments when the sidetanks extend up to the deck and the cargo is shifted up against these longitudinal bulkheads as shown in the section. The intersections between curve *A* (*KN*) and the curves *B*, *C* and *D* give the angles to which this vessel would heel if consideration is given only to the effect of the shifting of the cargo. Under the effect of the waves, the vessel would actually roll

of heel would be only 21 and 26 degrees. As the deckline is still above the waterline here, such angles of inclination would, probably, not be directly dangerous for the vessel. If the vessel, however, is rolling heavily it is obvious that even such a list is not without danger.

Fig. 8 shows the results for a lake freighter 590 x 58 x 33 feet. The curve marked *C* represents the inclining lever when the vessel is loaded with iron ore which has shifted. In this condition the angle of heel will be about 23 degrees. Some calculations were also made for this vessel when loaded with a cargo of wheat. Of grain cargoes this is probably the most dangerous. It has a high density and thus leaves large empty spaces in the hold. It has a small angle of repose, about 23 degrees. It is well known that when a ship is rolling at sea, a cargo of grain is liable to shift at a much smaller inclination than the angle of repose. It was shown by Professor Jenkins that in one vessel a shift of cargo took place at as low an angle rolling as 16½ degrees*. There is no doubt that the lake freighters may at times roll to larger angles than this. Curve *B* in Fig. 8 is drawn for the following conditions: The vessel is loaded to a draft of 19 feet with a cargo of wheat which is evenly distributed for the total length of the cargo hold. The cargo has shifted as indicated by the line *B* in the

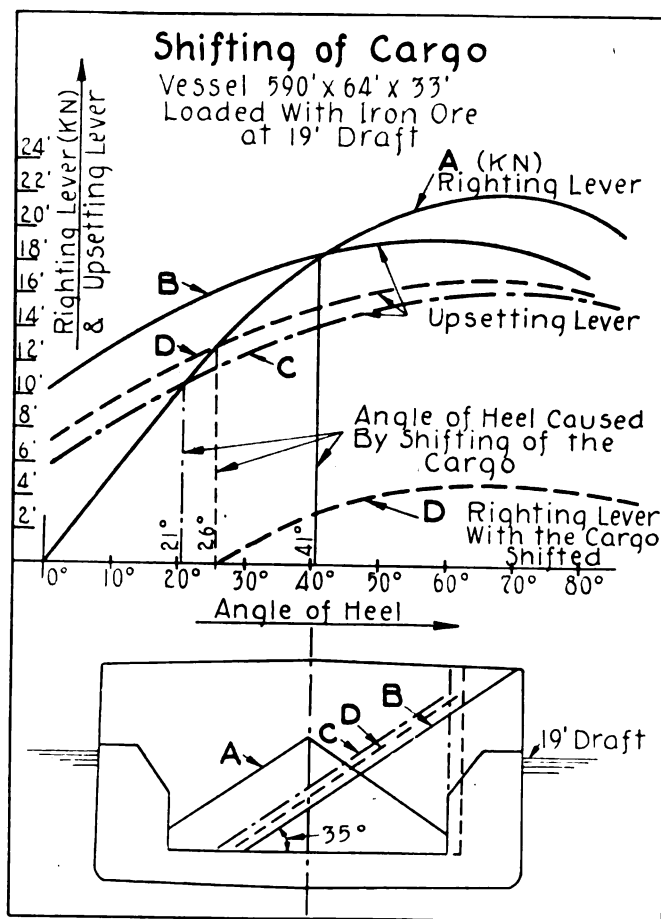


FIG. 7—EFFECT OF SHIFTING ORE CARGO

over further and tend to oscillate about the angle of inclination produced by the shifting of the cargo.

The intersection of curves *A* and *B* gives an angle of heel of about 41 degrees. Although, even at this point, we still have a large righting arm, such a permanent inclination would be very dangerous. The deckline would be under water, and the hatchcovers would probably be damaged and water be admitted into the holds.

If the shift of cargo is more moderate, as in condition *C* and *D*, the angle

section shown in the illustration.

From the diagram it is found that in this condition an angle of heel of 23 degrees will be reached. At this angle the deck is still about 2 feet above the waterline.

By distributing the cargo in a different way the stability can, however, be much improved. If we fill some of the cargo holds entirely up to the deck, the wheat in these holds will not be able

*"On Shifting of Cargoes" by Professor Philip Jenkins, Trans. I. N. A., 1887.

to shift, and the shifting moment will thus be decreased. Curve *D* represents the condition when the holds for 50 per cent of the length are entirely filled up. Loaded in this way the ship will roll over to only about 13 degrees, which, of course, is a great improvement from the viewpoint of stability.

As some of the smaller lake freighters are constructed without any side-tanks, some calculations were also made for a vessel of such construction. Fig. 9 shows the results of these calculations which are for a vessel 420 x 50 x 28.45 feet. Curve *B* gives the inclining arm with a cargo of wheat which has shifted as indicated by line *B* in the cross section. In this condition, the vessel will roll over to about 14 degrees. The calculations thus show that

ment will be extremely large and will cause a heel of about 53 degrees. Even though there still is a righting moment after this angle has been reached, this angle would undoubtedly be disastrous. The hatches would be partly submerged; and, in all probability, water would find its way into the holds and cause the sinking or capsizing of the vessel.

(To Be Continued)

Quick Way To Find Fuel Costs

(Concluded from Page 423)

a ship will be clear when it is considered that the fuel costs represents from 25 to 30 per cent of the total cost of operation, while the much

total cost of operation, which is only 42 per cent of the increased cost which a ship is forced to bear in using oil instead of coal under present market conditions. For some time recently, the price of fuel oil in New York was 10 cents higher per barrel than that used for the above example, while coal could be had for the same price used.

Changing over from oil to coal in a ship regularly accustomed to burning oil is at the best a question which cannot be lightly or hastily settled. Many varying conditions must be taken into consideration. Passenger ships running on schedule, with high average speed requiring steady and high pressure steam, with quick turn arounds where ease and

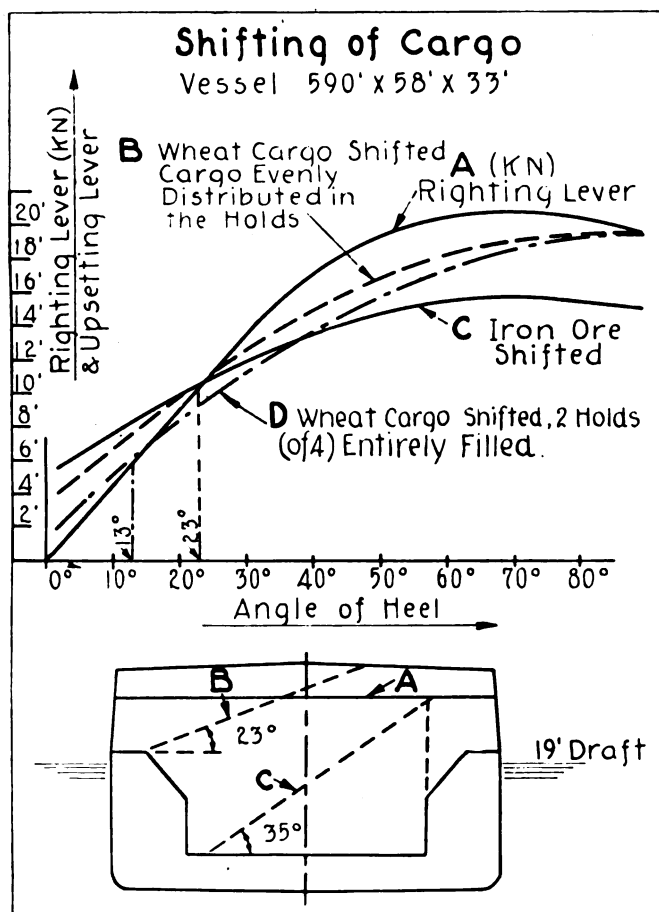


FIG. 8—EFFECT WHEN SHIP HAS SIDE TANKS

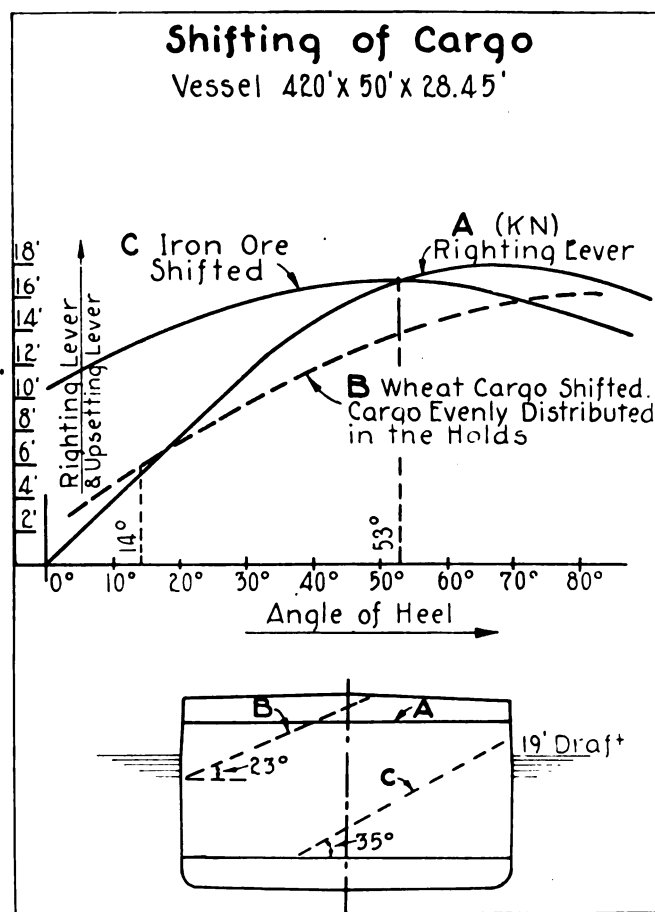


FIG. 9 EFFECT WHEN SHIP HAS NO SIDE TANKS

this vessel will not be inclined to very large angles by a shifting cargo of wheat. Such an angle as 14 degrees is really not dangerous for the safety of the vessel. However, even in this vessel it is safer to fill some of the cargo holds entirely up to the deck and thus reduce a possible angle of heel.

Curve *C* gives the area of the upsetting moment when a cargo of iron ore has shifted as indicated by line *C* in the cross section. Here, owing to the absence of sidetanks, the upsetting mo-

discussed excessive costs of wages on American ships represents only from 10 to 15 per cent of the total cost of operation. Taking 27 per cent as the fuel costs on a typical oil burning American ship, a 21 per cent reduction in this item would mean a saving of 5.7 per cent in the total cost of operation. On the other hand, a 20 per cent increase in wages taking them at 12 per cent of the total cost of operation would mean an increase of 2.4 per cent in

rapidity of bunkering is so important, where cleanliness and elimination of trouble with fireroom crews means so much, will not go back to coal even in the face of excessive costs, unless the source of supply becomes limited or the price becomes absolutely prohibitive.

For freight ships, however, the choice is still comparatively free, especially in these days when full cargoes either cubic or deadweight are the exception instead of the rule. A

ton of coal will occupy about 43 cubic feet, while a ton of fuel oil will occupy about 37½ cubic feet. Considering the higher heat value and greater boiler efficiency, it will take 46 per cent more weight of coal than weight of oil for the same amount of steam produced. This in turn means that it will take 67 per cent more space for bunkers if coal is used instead of oil. These figures are probably somewhat favorable to oil but the excess weight of coal over oil for the same amount of steam produced would hardly be less than 41 per cent and the excess space required for bunkers not less than 62 per cent.

Another important feature is the utilization of double bottom tanks for carrying bunker oil. In some modern cargo ships with a steaming radius of 6000 nautical miles, 85 per cent of the fuel oil is carried in these compartments, which cannot, of course, be used for carrying coal. Under these circumstances, for such a ship on the basis of the same steaming radius, a space for coal bunkers would have to be found in a portion of the ship now available for cargo, equal to about 1.52 times the total space occupied by the oil in double bottoms and side bunker tanks, or approximately 40,600 cubic feet, and this presupposes the use of the present side bunker tanks for coal. A conservative estimate more favorable to coal would mean the loss of at least 39,000 cubic feet taken over for coal bunkers. With a full measurement cargo offered this would mean a serious loss of cargo space.

However, conditions are not in many cases so unfavorable to changing from oil to coal. Many oil burning ships have deep tanks extending from side to side forward of the fireroom of considerable size, which can be prepared to take coal. Often also, spaces in the bridge or in the 'tween decks could be temporarily bulkheaded off for use of coal bunkers without seriously affecting present cargoes offered. Every available cubic foot of cargo space is rarely used. The increase in fireroom crew necessitated by the use of coal is also an item which must be taken into consideration. As the difference in relative costs of oil and coal in favor of coal increases, this item is soon absorbed as the fuel bill is easily double the entire ships' wages in the total cost of operation.

Owners and operators of American ships fully realize that they can-

not hope to acquire even a small share of the ocean carrying trade unless they are intelligently and aggressively alive to all questions affecting economy of operation. Slipshod careless methods spell the certain doom of their enterprises. A manager of ships should have just as accurate a knowledge of the costs of operation as the manager of a successful industrial plant ashore. Constant searching inquiry into all expenditures to establish that the greatest possible results are obtained, for disbursements made, is necessary.

It is for the purpose of directing attention to the largest single item of cost in the operation of a ship and of indicating a possible reduction in this expenditure that the accompanying chart, graphically analyzing the comparative fuel costs of oil and coal, has been prepared.

Will Convert Homeric to Oil Burner

The London company of the Todd Shipyards Corp., New York, was recently awarded the contract to furnish Todd oil burners and necessary equipment for the conversion of the White Star liner HOMERIC from coal to oil burning. It is expected that the work will be done at Belfast beginning in October. The HOMERIC is the third largest vessel of the White Star fleet, and is 34,356 gross tons. She has 30,000 indicated horsepower, steam for which is furnished by 12 double-ended boilers with a total of 80 fires. The American concern received this order in face of the natural competition of British firms.

Shipping Board Vessels Are Better Loaded

Chairman Edward P. Farley of the shipping board has made public a comparison of results from operation of ships during July and August, 1923 as compared with the like two months of 1922. These figures show that the revenue received by shipping board vessels during July and August, 1923, was \$4,437,699.32 as against \$3,308,809.21 for July and August, 1922. This represents an increase of 35 per cent.

While the total number of cargo tons carried during July and August, 1923 shows but a slight increase over tons carried for the like period in 1922, the average number of tons carried per ship shows a substantial increase. During July and August, 1922, the average cargo per ship was 6525 tons, and the average for these two months in 1923 was 6981 tons.

Late Marine Patents

Copies of any one of these patents may be obtained by forwarding 25 cents in stamps to Siggers & Siggers, patent attorneys, National Union building, Washington, and mentioning MARINE REVIEW.

1463507—Device for increasing the sound energy with submarine sound transmitters. Walter Hahnmann, Kitzemerg, near Kiel, Prussia, Germany, assignor to the Firm Signal Gesellschaft m. b. H., Kiel, Work Ravensberg, Germany.

1463662—Lifesaving boat. August Baumgart, Lind, Wash.

1463933—Marine boiler. Richard Walsh, Mobile, Ala.

1464698—Fire control apparatus for naval guns. James Blacklock Henderson, Lee, England.

1465787—Apparatus for lowering and raising ships' boats. Harry W. Broady, Bayside, N. Y., assignor to American Balsa Co., Inc., New York.

1465790—Float device. David J. Ravellet, New York, assignor to American Balsa Co., Inc., New York.

1465990—Ammunition hoist especially suitable for use on board ship. Hugh Warren Lee and John Window Swindale, Newcastle-on-Tyne, England, assignors to Sir W. G. Armstrong, Whitworth & Co., Ltd., Newcastle-on-Tyne, England.

1466601—Float. James I. Sanders, Columbus, Kans.

1466634—Wing-shedding means for flying boats. John P. Tarbox, Garden City, N. Y., assignor by mesne assignments to Curtiss Aeroplane & Motor Corp., Buffalo.

1466551—Aircraft, submarine, torpedo and other totally immersed craft or structure. Albert Peter Thurston, London, England, assignor of two-thirds to the Bristol Aeroplane Co., Ltd., Bristol, Eng.

1466315—Apparatus for scrubbing ships' bottoms below the water level. Ludvig Thorsen, Stavanger, Norway.

1466671—Float. Albert H. Mori, Brooklyn, N. Y.

1466675—Submersion control for divers' armor. George Paul Eugen Stolle, Liel, Germany.

1466705—Ship construction. Eleuthere Paul Du Pont, Montchanin, Del.

1466734—Life preserver valve. Maximilian Charles Schweinert, West Hoboken, N. J.

1466915—Submarine mine. Ernest F. Nichols, New Haven, Conn., assignor to government of the United States, represented by the secretary of the navy.

1467426—Art of steel ship-hull construction. Robert E'wood Ellis, Everett, Wash.

1467463—Pneumatic swimming belt and method of making same. John M. Welch, Des Moines, Iowa.

1467611—Submarine war vessel. Kennedy Dougan, Minneapolis.

1467642—Multiple operating mechanism for ships' ports and the like. Albert H. Kenneweg, Brooklyn, N. Y., assignor, by mesne assignments to Kam-Kap Appliance Co., Inc., a corporation of New York.

1467763—Fishing boat. Nels A. Lybeck, Brooklyn, N. Y.

1467982—Ship-steering apparatus. Peter A. Johnson, Portland, Ore.

1468038—Safety arrangement for launching lifeboats from vessels. Paul William Scurin, Gottenberg, Sweden, assignor to Gesellschaft für Schiffsausrüstung und Duvitbau, Hamburg, Germany.

1468305—Sender diaphragm for submarine sound signals. Willy Kunze, Bremen, Germany.

1468327—Construction of open life boats with partially collapsible sides. Giovanna Kinesi, Genoa, Italy.

1468464—Life preserver. A. D. Elias, Philadelphia.

1468622—Salvage apparatus for raising sunken vessels. Aage Frederick Andersen, Rolfe, Iowa.

1468646—Apparatus for cleaning ships' bottoms. John Overall, Drummoine, near Sydney, New South Wales, Australia.

1468720—Fishing boat. Julius C. Low, Kansas City, Mo.

Sale of U. S. Vessel

(a) TAKE CLEAR, steel cargo, 2875 deadweight tons, 2018 gross tons, purchased by the Construction Materials Co., Chicago.

a) By the terms of sale the buyer is obligated to convert this ship to diesel propulsion.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

IT WAS brought out in the case of *Hines v. Butler*, 278 *Federal Reporter* 877, that the steamship *VIRGINIA* owned by a railway company taken over by the government during the war, formed one of a line which plied on regular trips between Baltimore and Norfolk, carrying both passengers and freight. The boat left Baltimore one night for Norfolk, and left Norfolk the next night to return to Baltimore. Fire which broke out in May, 1919, caused her destruction, as it did of most of her freight. Some of the passengers were drowned and others seriously hurt. Suit in admiralty to limit liability was brought. The court held that the steamship was practically a ferryboat, and that necessarily all of the regulations intended for the protection of human life and human property would apply more strongly to a boat of this character than to a boat whose stay in port is only as may be after the termination of a voyage of more or less duration. The court said: "It was not the case of a sailing vessel or ocean steamship, which leaves for a voyage of more or less duration, and as to which the owner can not do more than see, at the time it leaves the wharf for its voyage of uncertain duration, that it is staunch, seaworthy, and properly equipped. In the case of the *VIRGINIA*, as in the case of any other ferryboat over waters of some length, the vessel was at a known point. It was in port every day, being absent only at night. If Baltimore was the home port, it was in Baltimore every other day; but, as Norfolk was equally a port in which refitting or inspection can be done, it was practically in a place where it could be daily under inspection of the owner. * * * The position of a ferryboat daily carrying numbers of passengers is quite different from that of a mere cargo steamer, going to different ports as business may call it."

It appeared in the case of *ROSEMARY*, 277 *Federal Reporter* 674, that the terms of the charter party involved showed that the parties contemplated that the vessel, which was chartered to carry a cargo of mahogany logs from Secondee or Axim, Africa, to Mobile or Gulfport, was before entering upon that service, to carry cargo to Durban, charterer furnishing "said vessel a full and complete cargo of mahogany logs under and on deck." The charter party fixed no definite time for the vessel to be at Secondee or Axim ready to receive the cargo, and the charterer failed to furnish sufficient logs to fill the hold and deck space available for carrying logs. The court held that the shipowner's obligation as to arrival ready to receive cargo was complied with if there was no delay

which was unreasonable under the circumstances, and that the master was entitled to recover for dead freight, which is the compensation due when the charterer fails to ship the full amount of cargo stipulated for unless in some way the master has been barred from enforcing that claim. In this case, it further appeared that the charter party allowed the charterer 15 days for loading, and that without any fault on the part of the vessel or its owner, 25 days were consumed in delivering and loading the logs furnished, which as said above, did not constitute a full cargo. The court held in this regard, that the charterer was not entitled to credit on the dead freight for the time saved by the vessel in consequence of the full and complete cargo not being furnished.

A vessel which had started in the rear of a large convoy, and which at the time of collision had come nearly, if not quite, abeam of the vessel ahead, was an overtaking vessel, it was decided in the case of *WAR POINTER*, 277 *Federal Reporter* 718, and as such was bound to observe the course of the other vessel and keep away from it; to this end her lookout was under the duty to keep such other vessel under vigilant observation for every appearance of unsafe approach. This duty was the more imperative in this instance, because the vessels in the convoy were sailing without lights and necessarily near each other.

"Seamen * * have constituted from early times a peculiar class. The unusual protection extended to them is reflected in the familiar saying that they are wards of the admiralty."—*Cricket Steamship Co. v. Parry*, 263 *Federal Reporter* 523.

Where a charter party contained a provision requiring the charterer to provide and pay for coal and other things which were paid for by a shipping company, such company, it was decided in the case of *Pensacola Shipping Co. v. United States Shipping Board Emergency Fleet Corp.*, 277 *Federal Reporter* 889, did not acquire a lien on the ship or a claim against its owner, under section 3 of act June 23, 1910, where such company, not knowing of the terms of the charter party, made no effort to obtain information as to its terms, although in communication with the charterer several weeks before the vessel's arrival at the port; nor did such payment give the shipping company by subrogation the right to enforce the liens in favor of the actual furnishers, who were not shown to have been chargeable with notice of

the terms of the charter party—so far as the vessel and its owner were concerned, the shipping company was a mere volunteer in making the payment, and the equitable right of subrogation does not exist in favor of a mere volunteer, who pays a debt of one person to another.

"A vessel navigating in a fog must go no faster than will permit her to stop within the distance she can see ahead."—*HAVEN*, 277 *Federal Reporter* 957.

The limited liability act was enacted for the benefit of the shipping interest and should be construed in a spirit of fairness, with a view of giving the shipowner the full benefit of the immunities intended. As so construed, insurance collected by a shipowner for loss of a vessel when the event occurred for which he seeks limitation of liability, is not part of his interest in the vessel, and is not required to be surrendered. The privity or knowledge of a corporation shipowner, which will preclude its limitation of liability, must be that of the managing officers of the corporation, and where the owner in good faith appoints a competent agent to equip, man, or maintain a vessel or her machinery, acts of omission or commission of the agent, not participated in personally by the owner, do not constitute privity or knowledge, within the meaning of the statute. Privity or knowledge, as used in the statute, imports actual knowledge causing or contributing to the loss, or knowledge or means of knowledge of a condition of things likely to produce or contribute to the loss without adopting proper means to prevent it.—*PRINCESS SOPHIA*, 278 *Federal Reporter* 180.

The lien which attaches to a vessel for collision or breach of obligation is not enforceable against the vessel so long as it is in the possession and service of the government; however, upon the cessation of such possession, the lien is enforceable and process may be issued. A new owner, it was held in the case of *POCAHONTAS*, 278 *Federal Reporter* 214, must take the vessel subject to whatever lien exists against her, and he must, therefore, make inquiry as to the past of the ship and the liens thereon.

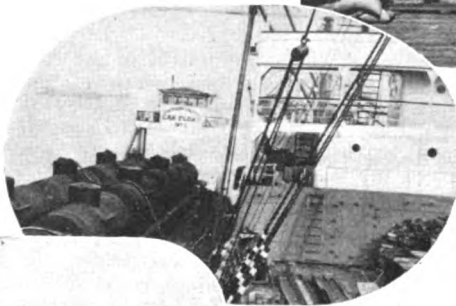
Tugs are held to a high degree of diligence in endeavoring to save a tow to which they are attached, or which has gone adrift, and the tow can not be abandoned until all reasonable efforts for its preservation have been exhausted.—*BETTY*, 278 *Federal Reporter* 220

Photographs from Far and Near



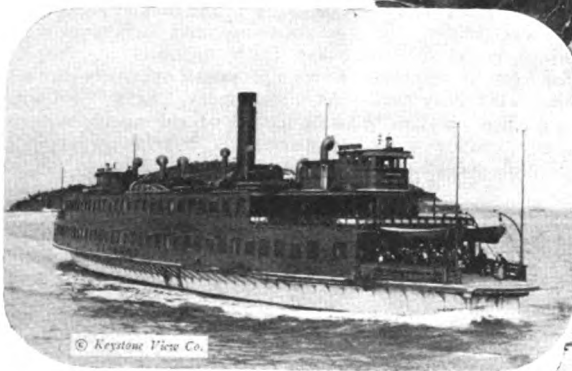
Since the Titanic disaster in 1912, no lives have been lost on the North Atlantic from collision with ice. The danger area is covered by an ice patrol. The governing board includes, left to right: Dr. C. F. Marvin; Capt. F. B. Bassett; Rear Admiral W. R. Reynolds, commandant of the coast guard; Dr. S. C. Brown and Dr. H. F. Moore. Standing: Dr. Henry Biglow and John Menus Jr., secretary.

Cocoonut oil is pumped directly from steamer to railroad tank cars in San Francisco bay. A time saving is made over the plan of pumping first to storage tanks.

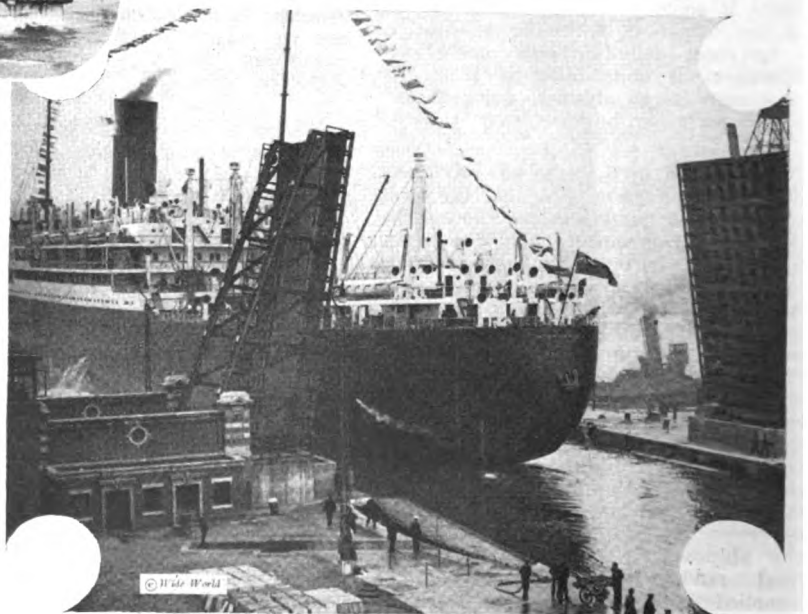


California has opened a new grain terminal at San Francisco. The loading platform shown is 90 x 700 feet and is intended for handling two ships at once.

Satisfactory service is being given by the electric ferry built at Los Angeles for San Francisco bay trade. She is the first of her type.



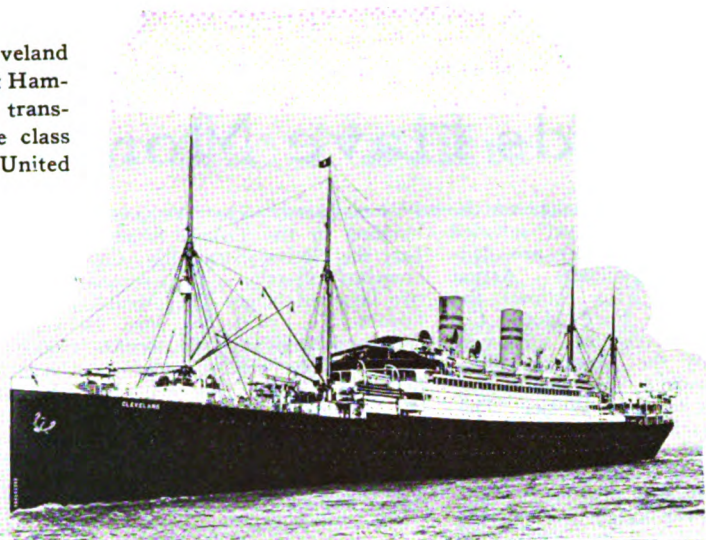
Big London liner Minnewaska, twin screw, 21,500 tons, now running to New York. She was built at Belfast and is the largest ship sailing from the Thames river. She receives the "Minne" liner service interrupted by the war.



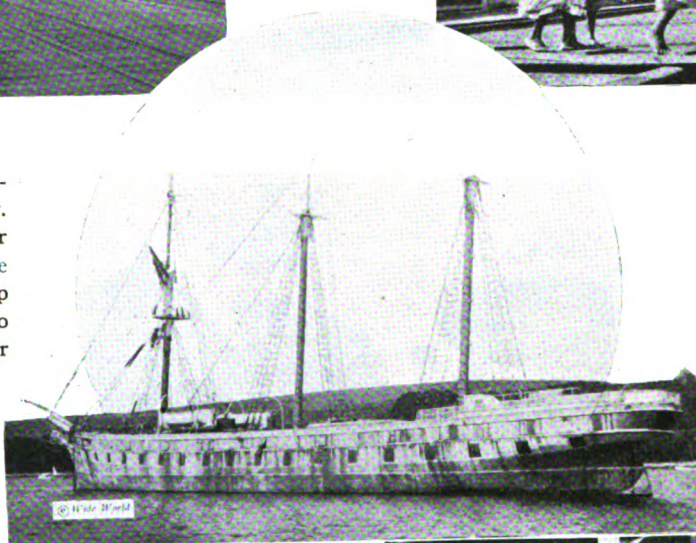
Latest Marine News in Pictures

American owned liner Cleveland which after reconditioning at Hamburg is ready to reenter transatlantic trade. She is a one class cabin ship owned by the United American Lines.

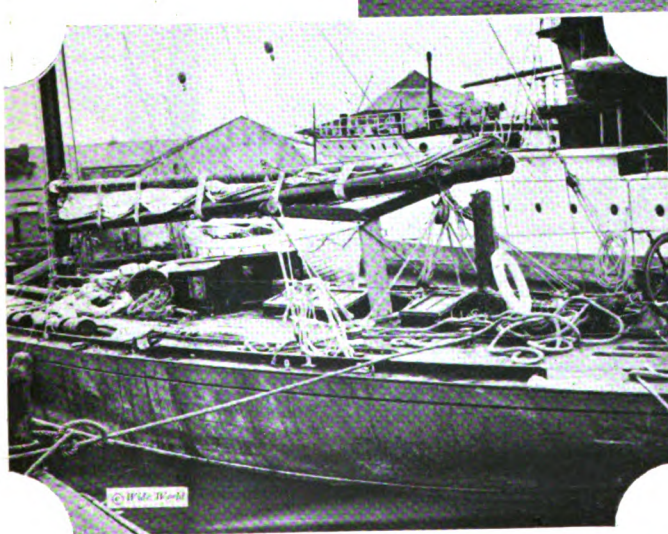
Coal bunkering at Jamaica is done mostly by negro women, as shown in the two views. They get one penny for each basket and need keep no books as they are paid as they deliver each basket.



Famous China tea clipper Cutty Sark in Falmouth harbor. She is to be restored to her original clipper rig, through the generosity of a sailing ship lover who found she was to be scrapped. Below racer Shamrock IV finishing her transatlantic trip with crushed life boat and shorn mast.



Pumping air cushions for padding the compartment on the Aquitania occupied by the Derby winner Papyrus on his transatlantic trip to race America's best.



Activities in the Marine Field

Latest News from Ships and Shipyards

Lake Yards Have More Orders in Sight

NEEDED for new ship tonnage on the Great Lakes is not yet satisfied and additional inquiries are definitely before lake shipbuilders. Action is expected shortly. This follows the contract placed by the Ford Motor Co. for two large bulk freighters, one vessel being taken by the American Shipbuilding Co., Cleveland, and one by the Great Lakes Engineering Works., Detroit. These vessels will be 611 feet in length over all, 590 feet keel, 62 feet beam and 32 feet deep. Diesel engines will be installed, the first time this type has been selected for the big lake freighters. With twin screws, the rated speed will be 13 miles or slightly faster than the standard lake ship.

Electric auxiliaries will be used including winches, steering gear and hatch shifting device. The accommodations for a few passengers will be unusually elaborate.

These are the first ships ordered for

1924 delivery. The WILLIAM K. FIELD building by the Toledo Shipbuilding Co., for the Reiss Steamship Co. will be launched shortly. The second of the two large passenger liners building at the Lorain, O. yard for the Detroit & Cleveland Navigation Co., will be launched Oct. 20. She will be christened GREATER BUFFALO. These two will complete the 1923 scheduled list of launchings. The GREATER DETROIT, big new liner, has been towed from the Lorain yard to Detroit to receive her engines and boilers and for finishing.

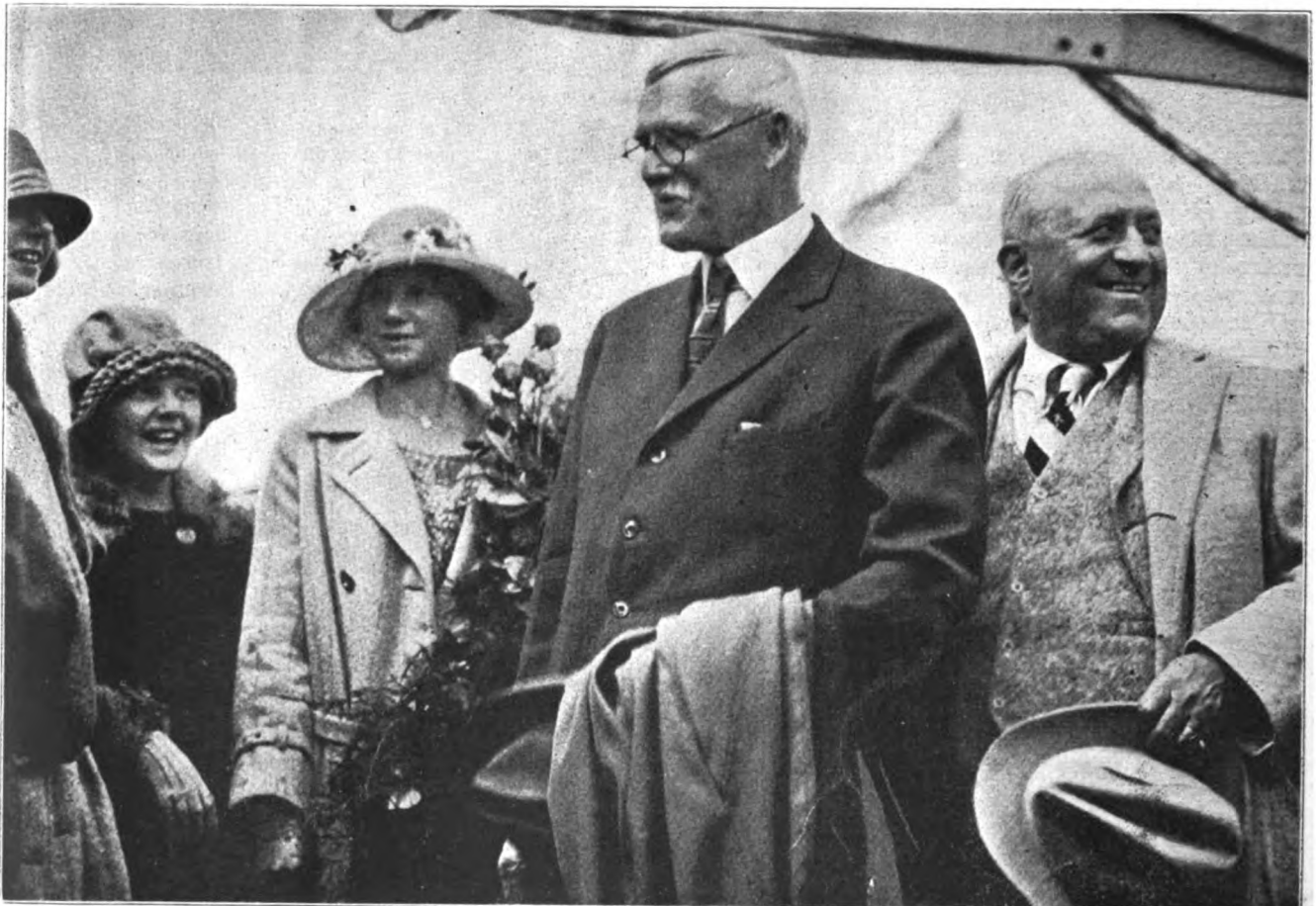
The Jenkins Steamship Co. has bought the steamer W. F. FITCH and barge ALEX MAITLAND from the Pioneer Steamship Co., who had bought these ships from the Franklin Transportation Co. in the spring.

The motorship TWIN PORTS has com-

pleted her first trip from New York to Duluth. She has been in service continuously since her trial trip in September, leaving Ashtabula for Buffalo and New York. She handled cargoes both ways without difficulty, handling easily through the narrow channels of the barge canal.

The steamers HURONTON and CETUS collided Oct. 11 in Lake Superior off Caribou island. The HURONTON sank in about 600 feet of water. The crew was taken off by the CETUS. The lost ship was owned by the Mathews interests of Toronto. She formerly was the HURON. The CETUS has been dry-docked for inspection and repair.

The auxiliary schooner MOONLITE, built by the Toledo Shipbuilding Co., Toledo, O., for the Standard Oil Co. of New Jersey about seven years ago, is



Left, Miss "Betty" Heckel, daughter of Col. George Heckel, Detroit park commissioner, who won the name contest of the Detroit & Cleveland Navigation Co. for the two new boats now being constructed at a cost of \$7,000,000. Next to Miss Heckel is Helen McMillan, daughter of J. T. McMillan, vice president of the company, who sponsored the first of the two new boats, the GREATER DETROIT, at the recent launching. Beside Miss McMillan is Frank E. Kirby, noted marine engineer and architect, who designed the steamers, and at the right is A. A. Schantz, president and general manager of the D. & C. company

being converted to a full powered diesel driven ship. Bids were received on Oct. 15 by the Admiral Line, Seattle, the present owner. The engines used will be transferred from a wooden ship owned by the same company. Three

sister ships will be converted later by transfer of engines from wooden vessels.

The old schooner CARRIER, formerly used by the Chicago yacht club as a

club house in Lincoln park, Chicago, sank on Oct. 1 while being towed to Waukegan, Ill. The hull is 123 feet long, 26 feet wide, and 8 feet deep. She is grounded in 13 feet of water, about 1500 feet from shore.

Up and Down the Pacific Coast

FORTY-NINE thousand tons of Japanese shipping was chartered at San Francisco on Sept. 28 for the wheat trade out of Canada to the United Kingdom and continental European ports. The tonnage represents seven Japanese carriers of Suzuki & Co. and the fixtures set a post-war record for the number of vessels chartered in a single day from one company.

The fixtures were made for December and January loading out of north Pacific ports. Kerr, Gifford & Co., Strauss & Co. and Richardson & Co., the latter a British Columbia concern, were the main charterers of the seven vessels. The rate ranged from 36 shillings 3 pence to 37 shillings 6 pence.

This marks the first activity in this trade in three months and is ascribed to a more healthy tone in the general business conditions in Europe. The United Kingdom and continental grain market has been extremely dull during the last three months.

Coupled with the above activity it is expected that within a few days much life in the charter market out of the Pacific coast to Japan, due to the demand for building materials and food supplies, will be seen. It is estimated that five billion feet of lumber will be required for rebuilding the devastated area of Japan, the majority of which will be drawn from the Pacific Northwest.

The Pacific coastwise freight business is picking up to the extent that some companies have been forced recently to hold back freight consigned on steamers departing from San Francisco port to the northern ports. Coastwise operators report that northbound movement is heavy and that the southbound general freight business is above normal. A revival is noted in the lumber trade from northern ports to San Francisco and San Pedro and indications point to the continuation of this heavy traffic for some time to come.

The report of the California state harbor board for the month of August showed a total inbound tonnage through the port of San Francisco, of 663,439 tons, and an outbound total of 334,291, making the total freight movement for the month 997,730 tons, the largest in the history of the port. Segregation of the report shows 114,118 tons of coastwise freight received inbound, 283,154 tons inland and 266,167 tons of foreign freight arriving. The outbound tonnage figures represent a coastwise shipment of 52,911 tons over local piers, 153,034

tons of inland freight and 128,346 tons of freight shipped for foreign ports.

Comparing the total tonnage for August this year with that of July, shows an increase of 65,800 tons during August. For July, 1922, the total tonnage passing through the port was 776,762 tons and for August last year, 867,932. These figures show an increase of 129,798 tons for August of this year over the same month of the preceding year.

The tonnage of vessels moving through the port of San Francisco for the month of September increased by 658,495 tons over that for August. During the month 609 vessels arrived and 615 departed. For the first nine months of this year, 4971 vessels have arrived and 5077 have departed; an increase of 1780 vessels, departing and arriving, over the same period of 1922. The tonnage figures for the month of September show 1,347,475 for arrivals and 1,362,151 for sailings, the total for the month both incoming and outgoing being 2,709,626 tons.

On Sept. 6, a ballot was cast by the intercoastal westbound conference as a sort of test to gauge the sentiment in reference to removing the rate-making body from New York to San Francisco. An official election to decide the issue is expected in the near future.

Virtually all shippers on the Pacific coast desire to have the westbound rates fixed there. They state that practically all merchandise shipped to the Pacific coast is purchased f.o.b. eastern mills and that they, as the buyers, should have the right to have a say in the matter of rates and shipping conditions as against other parties thousands of miles away who know little or nothing of market and shipping conditions on the Pacific coast.

Plans just adopted by the port of Tacoma provide for the extension of track-ave and a lumber storage capacity of 30,000,000 feet, doubling the present capacity. If future business warrants, a further extension of storage facilities can be made to provide for 54,000,000 feet. The port has just purchased a \$27,000 lumber crane from the Colby Steel & Engineering Co. Fabrication work on this crane is to be done by the Todd Drydock & Construction Corp.

Transpacific steamship operators express satisfaction with the results of the

recent conference at Chicago where representatives of both Atlantic and Pacific lines to the Orient arrived at a common understanding as to rates and practices. The new schedule will be of primary interest to shippers in the Middle West.

After operating in north Pacific waters for ten seasons, the steel steam whalers Star I, Star II and Star III have left Puget sound for the scene of future whaling hunts in the Antarctic. The three vessels were built in 1911 by the old Seattle Construction & Drydock Co. Some time ago they were sold to the Ross Sea Whaling Co., Sandefjord, Norway, and with sturdy Norwegian crews they are now steaming to the frigid regions of the South Pacific. The Pacific will be crossed by way of Honolulu and Australia. Hereafter they will operate out of New Zealand ports as headquarters.

Hoisted from a dock by a cargo hook attached to the boom of a steamer loading cargo, a Seattle longshoreman was removed from the jurisdiction of the state industrial insurance commission into admiralty court, according to the decision of an assistant state attorney general. The hook caught in the worker's belt which held fast while he was bodily lifted from the dock but when he was high in the air the belt gave way and the man fell to the steamer's deck, being seriously injured. According to the decision, he can not recover from the state, under whose insurance longshoremen are protected, but must file suit in admiralty in order to recover damages. In other words, because his belt carried him beyond the edge of the pier the state industrial department disclaims responsibility and contends that the claim is one to be settled in admiralty.

Attacking the constitutionality of the income and excess profit war tax act, suit has been filed by the Nippon Yusen Kaisha against a former collector of internal revenue asking refund of \$1,124,355 plus interest and costs. The sum sought represents income and excess profit taxes paid under written protest by the Japanese steamship company on Sept. 27, 1918. It is charged that the collector compelled payment of the amount in question upon business transacted through Puget sound ports between Oct. 1, 1916 and Sept. 30, 1917. The company made a return of income as taxable of \$1,137,670 but claims the collector forced payment of taxes on a further income of \$3725,207 derived on the operation of foreign steamships.

from United States port to foreign ports. The complaint charges that the income act is in contravention of the fifth and fourteenth amendments to the constitution of the United States as it purports to impose a tax on the net income from the operation of foreign vessels in business between this country and foreign ports.

* * *

In an effort to stimulate the movement of vegetable oils from the Orient through Seattle, the transcontinental railroads have agreed to absorb the wharfrage of 50 cents per ton on bulk shipments of vegetable oils which are pumped from the steamship to storage tanks and then reloaded into tank cars for transportation to eastern destination.

* * *

Contract to remove approximately 1,000,000 cubic yards of material from the ship channel at the entrance to the Lake Washington canal, Seattle, has been awarded to the Puget Sound Bridge & Dredging Co. The amount involved is about \$400,000.

* * *

The Lea-Matthew Shipping Corp., with headquarters at Seattle has been formed by Capt. T. H. Lea and A. Matthew, the latter formerly with the Universal

Shipping & Trading Co. The new company will represent the Latin American line at Puget sound ports.

* * *

The express liner H. F. ALEXANDER, formerly the GREAT NORTHERN, recently established a new record while in Seattle. The steamer was in port just 16 hours during which time 2806 tons of cargo were handled and 675 passengers landed and taken aboard. The cargo handling record was in excess of 175 tons per hour.

* * *

Four steamship lines operating on the Pacific have placed orders for the installation of the Kolster radio compass and position finder on 44 vessels.

* * *

According to present plans of the signal service corps, U. S. A., the new cable steamer DELLWOOD will be dispatched to London early next year to take aboard about 1800 miles of cable which is being manufactured by English firms at a cost of \$1,244,000. This cable is to replace the present line between Seattle and Sitka.

* * *

In a decision just rendered by the federal court at Seattle both ships were held at fault for the collision of the

GOVERNOR and WEST HARTLAND off Port Townsend in April, 1921. The GOVERNOR was a total loss. The court holds the damages should be divided.

* * *

Although she is lying in deep water at the bottom of Puget sound, the GOVERNOR was recently libeled by Ben L. Moore, as trustee of the shipping board freighter WEST HARTLAND. The libel is for \$79,345.20 and is directed against the Pacific Steamship Co. and the GOVERNOR. The claim represents the extent of the damage done to the WEST HARTLAND.

* * *

Unusual activity prevails along the Columbia river in the vicinity of Longview, Wash., where a new lumber city is being built. In preparation for loading deep sea vessels, the Long-Bell Lumber Co. has eight dredges employed in diking, draining and general construction.

* * *

Effective Oct. 1, Williams, Dimond & Co., San Francisco, relinquished the Pacific coast agency for the United American lines. Sudden & Christenson, previously representatives of Crowell & Thurlow, will hereafter act as agents for the United American, for both the intercoastal and European services.

Along the Atlantic and Gulf Coasts

PLANs are being considered for extending Baltimore's belt line railroad to completely encircle the harbor. The line, which is municipally owned, is at present 3½ miles long, and it is believed that the extension should be pushed in co-operation with other port development plans.

* * *

Negotiations between the port development commission of Baltimore and the Western Maryland railroad for the construction of piers for the latter on the McComas street frontage are approaching completion. The piers will be built out of the \$50,000,000 harbor improvement loan.

* * *

W. A. Blake & Co., Baltimore, have resumed the agency for the Sprague lines, operating to the Baltic. At the same time, Blake & Co. are relinquishing the East Baltic agency at Baltimore of Moore & McCormack.

* * *

First half of 1923 exports from Baltimore are valued officially at \$55,969,000 and imports at \$47,909,000.

* * *

With coffee imports of 118,489 bags already received at Baltimore this year and three additional boats on the way with 33,000 bags, last year's record of 133,000 bags will be far exceeded.

* * *

The University of Maryland is offering two courses in the water transportation phases of foreign commerce. Courses of lectures in port development

and operation and in the general economics of shipping, with particular reference to Baltimore, will be presented. G. H. Pouder, of the export and import board of trade, will conduct both courses.

* * *

September exports of coal from Baltimore reached 56,269 tons, with increased activity in the business as the month ended. The coal went on 11 vessels to eight countries, France leading in tonnage taken. Three coke cargoes also left the port during the month. Coal exports of 1923 from Baltimore have amounted to 1,301,520 tons.

* * *

Grain exports from Baltimore have dropped materially. During September, only 620,905 bushels were exported as compared with 6,436,931 barrels in September, 1922. Flour exports for the month were 97,117 barrels, against 85,982 barrels last year. Nine months of 1923 have produced grain exports from Baltimore of 36,198,684 bushels, as against 72,016,617 bushels, for the same period of last year. Flour exports increased from 355,208 barrels in 1922 to 423,186 barrels in 1923.

* * *

The Dollar line has opened its new offices at Baltimore in charge of G. S. Hinkins, formerly assistant to the general manager of the line at New York.

* * *

Entrances in Baltimore's coastwise trade during September reached 169 vessels of 425,829 net tons, while clear-

ances are placed at 197 vessels of 485,097 net tons. This is a substantial increase in number of vessels over August but a slight decrease in net tonnage.

* * *

In Baltimore's overseas trade during September, 44 vessels of 132,363 net tons entered and 41 vessels of 102,857 net tons cleared. This is a tonnage decrease for entrances as compared with August, but an increase in tonnage clearances.

* * *

The Maryland Towing Co., Inc., has been organized with \$25,000 capital stock to deal in towboats, lighters barges, etc.

* * *

The Baltimore & Virginia Steamboat Co. has been incorporated with capital stock of \$150,000 to operate in both the passenger and freight trade.

* * *

Baltimore's imports are growing by leaps and bounds. The business is particularly active in ores, oil, fruit, wood pulp, sugar and chemicals. General cargo has also shown marked increase in volume. Oil imports are averaging from 500,000 to 600,000 barrels weekly.

* * *

Late in September a record cargo of lumber reached Baltimore from Puget sound forests in the steamer POMONA. On board were 5,166,000 feet. The shipment was consigned to the Weyerhaeuser Timber Co.

* * *

The United American line steamship MOUNT CLINTON has arrived at the

Sparrows Point, Md., yards of the Bethlehem Shipbuilding Corp. for reconditioning from passenger to freight carrier. The MOUNT CARROLL, sister ship, has already been reconditioned at the Sparrows Point plant.

* * *

The houseboat TRED AVON on which the late President Harding made his Florida trip last spring, has been purchased in Baltimore by William Keyser. The vessel is 80 feet long, 17 feet 9 inches beam, and 9 feet 2 inches molded depth. She has two engines of 60 horsepower each, and was built at Camden, N. J., in 1921.

* * *

The giant liner LEVIATHAN on her trip from New York, which began Sept. 29, had the roughest crossing she has experienced since she entered the American passenger service, but she arrived on time and undamaged with the exception of a few smashed doors and port holes. Captain Hartley went to bed only once during the crossing, taking his meals and sleeping in the chart house. The liner first encountered a hurricane with waves running 35 feet high. Afterward she met heavy fogs, the combination of bad weather conditions reducing her speed considerably. Before landing the LEVIATHAN'S passengers signed a tribute to Captain Hartley, praising his handling of the big ship.

* * *

On Oct. 9, the light cruiser MARBLEHEAD was launched at the yards of the William Cramp & Sons Ship & Engine Building Co., Philadelphia. She is the fourth of five sister naval ships built or being built by the Cramp yard. These cruisers are 555 feet 6 inches in length over all, displace about 7100 tons on a mean draft of 13 feet 6 inches while their maximum of 100,000 horsepower gives them a speed of 35 knots.

* * *

The Triangle Intercoastal Motorship line, Galveston, Tex., with a capital stock of \$6000 was granted a charter in September by the state of Texas. The incorporators are G. E. Warriner, H. V. Pond, G. M. Warriner and others. The line will be known as the T. I. M. line and will operate from Galveston to Freeport, Goose Creek, Houston and other points along the intercoastal canal. Service will be started about Dec. 15 with one vessel propelled by a crude oil engine.

* * *

Clarke & Courts, Galveston, the largest manufacturing stationers south and west of St. Louis, will begin the importation of newsprint paper from Europe in a few weeks. The cost of the paper laid down at ship side will equal the price of domestic and Canadian paper in New York and it is the difference in freight rates that will make this a favorable proposition.

* * *

The British tanker G. R. CROWE while a short distance out from Tampico, Mexico, became disabled Aug. 25 and was towed into Galveston Aug. 31 by the Texas Co.'s tanker, PENNSYLVANIA. Repairs to the propelling machinery are now being made. On Sept. 22, the Texas Co. filed suit in the federal court

Map Scene of Monitor-Merrimac Battle

THE battle between the MONITOR the federal man-of-war, and the MERRIMAC, the confederate iron-clad—was fought in Hampton Roads on a straight line off Hampton creek about two miles from shore and in what is now regarded as the main channel, March 8 and 9, 1862.

The precise scene of the battle that so strongly influenced naval warfare, has just been determined by a party composed of Capt. Richard Curtis, of Norfolk, Va., one of the survivors of the crew of the MERRIMAC; General W. R. Smith, of Fortress Monroe; H. R. Booker, president of the Merchants' National bank, Hampton, Va.; Capt. A. G. Massenburg, of the Virginia Pilot association; and a party of army and navy officers, who surveyed the location with the aid of a navy tug. Captain Curtis, now 84 years old and in good health, was an officer of the MERRIMAC.

Maps prepared by army engineers were used in marking the location of the battle. One of these maps will be sent to Washington and the other retained by officials at Fortress Monroe.

Efforts will be made, it is said, to have the government mark the spot where the battle took place, for the benefit of the present and future generations and that it may be seen readily by passengers on ships entering and leaving Hampton Roads. It has been suggested that a suitable buoy be planted to mark the spot.

at Galveston against the Montezuma Transportation Co., Ltd., of Canada, owner of the G. R. CROWE for the sum of \$40,000 for salvage service rendered.

* * *

Capt. L. Bernicot, special representative of the director general of the Compagnie Generale Transatlantique (French line) in the gulf was in Galveston during September. He stated that two large passenger vessels and ten freighters belonging to that line are now operating in the gulf trade where only four or five were engaged last year. Two sailings a month will be maintained out of Galveston and Houston during the cotton season and possibly throughout the year. Previously there has been no regular service out of Galveston or Houston. The Texas Transport & Terminal Co. is the Galveston agent of the French line, E. S. Binnings being in charge.

* * *

During August, of the 92 vessels clearing for foreign ports from Galveston,

64.13 per cent were American vessels and 35.87 per cent were foreign owned. Vessels flying the British flag were next to the American and were 9.78 per cent of the total. There were 59 American and 33 foreign vessels cleared, nine of the latter were under British registry. The above figures show a percentage increase of 21.05 per cent and an increase in the number of vessels cleared of 16. The percentages last year were: American 60.52 per cent, foreign owned 39.48 per cent of which the British with 8.42 per cent were highest. The American increase was 3.61 per cent.

* * *

H. M. Wilhins of the Morgan line announced Sept. 23 that their sailings would be increased to four vessels a week between Galveston and New York. Cotton, copper, wool, lumber and California freight have increased to such an extent as to justify the increased service. During the three weeks beginning Sept. 23, the following vessels sailed: EL MUNDO, EL SIGLO, EL ORIENTE, EL DIA, EL VALLE, EL CID, EL SUD, EL ALMIRANTE, EL NORTE, EL RIO, EL OCCIDENTE and EL ALBA.

* * *

During the 2-week period Sept. 16 to 30, the cotton receipts at Galveston amounted to 317,196 bales. Sept. 25 was the date of the greatest receipts with 53,000 bales or 16 train loads or 883 carloads averaging 60 bales to a car. Receipts of the present cotton year to Sept. 30 were 733,779 bales, an increase of 189,688 bales over the like period last year when 544,082 bales were received. Approximately 359,000 bales were exported during the month of September. Fourteen vessels with about 240,000 bales cleared Sept. 29 for the end of the month sailing.

* * *

The shipping board vessel POLYBIUS, 10,009 deadweight tons, was assigned to S. Sgitcovich & Co., Galveston, for their Havre-Antwerp service.

* * *

O. L. Smith Jr., general manager of the Black Diamond Steamship Co., has left for an extended traffic survey of Europe. Mr. Smith will visit France, Germany, Holland, Belgium, Switzerland and England, and expects to spend six months in investigating traffic possibilities of these countries.

* * *

Baltimore has established a new bulk cargo unloading record. Recently, the Cottman Co. at Canton unloaded 5300 tons of sulphur in 15 hours and 25 minutes. During the first 7 hours of work, 4040 tons were unloaded. Two duplicate bulk handling cranes are used on the Cottman pier with buckets taking in from 9 to 10 tons of sulphur at one grab each.

* * *

Baltimore expects to benefit in her intercoastal traffic from the recent decision of the steamship lines at Philadelphia to cease absorbing the 50 cents a ton car unloading expense at that port. At Baltimore, the railroads unload cars free, which reflects no burden on the shipper, such as will now be in effect at the port of Philadelphia.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	428	1,818,981	477	1,978,023
August	468	1,855,045	520	2,039,732
July	462	1,799,886	490	1,962,302
June	466	1,799,908	518	2,075,654
May	500	1,849,548	501	1,874,019
April	469	1,818,531	467	1,788,555
March	477	1,764,093	494	1,857,212
February	395	1,437,919	413	1,529,096
January	423	1,679,843	439	1,690,010
December, 1922	397	1,569,778	473	1,819,341
November	426	1,626,068	463	1,805,798
October	452	1,846,327	467	1,848,037
September	519	1,985,981	542	2,104,884

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	92	236,293	74	182,700
August	97	251,295	73	180,771
July	109	269,158	77	177,700
June	102	257,507	69	191,633
May	105	267,441	82	207,209
April	87	218,177	83	229,333
March	111	306,580	76	209,261
February	67	160,678	54	139,701
January	98	287,240	64	182,402
December, 1922	78	209,962	63	167,736
November	75	221,130	78	241,326
October	80	205,137	73	202,326
September	103	261,963	74	224,079

Boston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	117	307,719	79	185,726
August	126	302,391	86	178,706
July	146	337,033	85	174,106
June	176	319,135	128	176,853
May	159	328,183	108	176,845
April	106	328,372	67	197,510
March	106	330,766	51	139,776
February	102	323,880	48	128,949
January	148	429,849	61	160,090
December, 1922	138	383,366	61	181,975
November	130	357,264	59	123,255
October	149	408,855	91	217,899
September	193	511,027	101	248,323

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	9	22,724	10	25,582
August	11	24,155	8	18,838
July	8	18,148	9	17,770
June	7	22,613	8	25,941
May	8	16,470	11	17,781
April	22	75,012	29	100,274
March	29	94,128	31	83,391
February	33	91,190	36	100,312
January	49	144,429	42	126,949
December, 1922	48	144,019	48	136,247
November	22	45,567	21	46,755
October	27	60,114	22	49,594
September	32	68,125	27	57,609

Providence

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	9	31,514	12	41,646
August	9	34,323	9	27,664
July	10	25,155	7	29,316
June	7	25,466	5	17,238
May	9	31,731	8	38,870
April	10	33,783	12	41,352
March	8	31,910	8	34,367
February	17	56,353	10	39,840
January	13	45,175	12	52,651
December, 1922	6	23,609	8	29,871
November	11	47,565	10	31,470
October	9	31,293	9	31,232
September	30	84,037	13	40,223

Baltimore

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	94	292,315	99	297,965
August	100	303,073	92	262,306
July	130	390,465	137	395,206
June	140	407,872	135	406,138
May	156	476,041	160	468,248
April	159	470,693	138	416,969
March	123	375,762	117	354,803
February	80	240,133	94	275,291
January	115	322,661	110	306,393
December, 1922	110	322,948	104	380,616
November	114	361,162	132	403,593
October	97	289,239	101	304,431
September	107	333,387	112	298,444

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	14	37,823	65	184,646
August	36	113,070	81	244,366
July	41	108,465	108	296,197
June	36	107,218	66	190,218
May	62	188,850	93	286,420
April	21	65,350	73	212,453
March	16	51,333	71	200,858
February	8	24,958	42	130,121
January	14	41,127	44	121,152
December, 1922	19	52,716	40	137,081
November	6	21,036	38	118,738
October	17	44,423	46	149,670
September	5	22,051	45	132,751

Savannah

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	29	82,569	27	83,689
August	18	55,205	20	59,452
July	18	53,071	22	60,711
June	27	77,392	31	90,636
May	26	67,494	23	63,395
April	26	81,582	27	83,365
March	31	95,905	30	89,323
February	31	87,315	31	87,703
January	28	93,564	28	93,587
December, 1922	22	66,619	17	57,279
November	14	41,665	15	40,606
October	19	52,065	19	46,054
September	26	68,878	26	73,540

Key West

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	69	77,687	74	84,612
August	80	94,591	82	93,028
July	88	96,514	86	97,260
June	93	105,045	93	102,123
May	97	102,033	95	101,422
April	84	85,964	83	88,475
March	91	88,639	90	83,220
February	69	68,735	64	68,658
January	89	81,622	86	79,210
December, 1922	74	77,623	78	85,839
November	69	71,740	70	71,705
October	61	67,755	64	77,225
September	57	64,645	59	62,676

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	23	86,194	41	138,470
August	17	64,218	31	106,478
July	19	66,048	24	86,474
June	22	87,147	25	87,419
May	16	58,889	21	72,663
April	17	62,287	22	84,940
March	16	69,514	22	78,124
February	13	46,219	18	66,446
January	12	47,848	25	97,674
December, 1922	13	46,245	31	104,065
November	18	63,016	32	106,367
October	24	91,306	26	103,602
September	27	106,768	36	129,215

New Orleans

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	205	548,914	169	444,881
August	235	605,671	249	639,802
July	237	602,017	227	587,966
June	230	584,271	226	572,211
May	221	550,817	237	603,128
April	234	612,572	217	621,539
March	253	648,990	269	682,080
February	204	559,638	206	539,965
January	242	713,389	233	693,524
December, 1922	211	543,884	222	573,111
November	220	598,306	219	599,150
October	239	630,306	235	625,605
September	212	555,017	223	571,299

Galveston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	64	164,854	100	290,715
August	69	172,330	92	257,371
July	70	178,601	77	198,209
June	77	178,013	82	209,893
May	78	181,759	97	256,745
April	65	162,317	77	209,388
March	58	170,841	97	287,278
February	48	146,944	76	233,591
January	69	219,967	89	282,889
December, 1922	64	214,952	79	260,159
November	56	174,964	87	304,352
October	59	156,587	85	260,702
September	48	144,403	56	187,724

Port Arthur, Tex.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	31	88,978	42	121,898
August	45	122,018	56	156,908
July	36	107,997	49	122,785
June	52	161,207	57	174,651
May	59	187,057	64	206,089
April	58	191,158	56	188,376
March	64	188,176	55	169,005
February	52	172,273	44	142,554
December, 1922	59	210,778	65	218,274
November	42	143,551	47	154,010
October	68	227,039	66	217,502
September	53	158,181	57	168,681

Mobile

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	60	126,005	52	105,247
August	64	191,968	67	146,191
July	73	136,242	66	123,405
June	64	136,311	61	132,863
May	74	167,509	74	174,851
April	85	199,871	82	163,074
March	88	203,032	88	206,285
February	83	186,479	72	160,777
January	77	145,151	67	153,001
December, 1922	66	123,746	56	119,821
November	68	147,775	53	130,769
October	59	143,207	52	110,398
September	66	121,037	51	85,801

Houston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923..	66	58,704	61	92,664
August	58	43,258	56	211,348
July	48	42,447	48	177,664
June	49	72,875	50	197,081
May	54	60,640	50	182,691
April	47	72,722	55	119,521
March	54	69,428	51	135,906
February	49	50,379	48	167,872
January	49	36,744	52	146,533
December, 1922..	58	70,948	53	195,323
November	65	72,192	63	215,043
October	55	57,106	53	168,254
September	43	46,600	43	87,005

Marine Business Statistics Condensed

Port Traffic Record

San Francisco

(Exclusive of Domestic)

Month	Entrances—		Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	43	165,798	63	209,930
August	64	208,625	65	224,918
July	68	244,530	58	189,348
June	59	204,204	65	227,566
May	64	230,778	69	244,321
April	61	199,831	63	227,467
March	50	168,399	71	237,195
February	47	165,333	60	214,686
January	51	156,249	65	216,083
December, 1922	54	187,648	68	234,385
November	42	154,024	42	154,280
October	59	159,855	69	261,687
September	52	163,697	65	233,079

Los Angeles

(Exclusive of Domestic)

Month	Entrances—		Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	88	257,074	110	193,177
August	80	193,400	63	161,380
July	78	265,294	56	187,987
June	87	212,483	53	175,799
May	78	246,275	53	179,360
April	87	269,264	72	165,302
March	115	251,459	90	185,155
February	86	148,957	83	137,564
January	91	153,564	92	141,332
December, 1922	133	132,114	76	83,537
November	110	111,803	111	112,934
October	117	115,548	138	94,522
September	61	127,969	96	133,561

Seattle

(Exclusive of Domestic)

Month	Entrances—		Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
September, 1923	32	142,052	40	159,006
August	39	173,885	37	163,188
July	30	148,607	32	149,239
June	36	147,186	39	184,732
May	29	133,752	37	159,393
April	32	141,569	31	133,950
March	28	129,070	30	138,428
February	26	120,548	39	156,258
January	27	125,551	36	155,129
(Inclusive of Domestic)				
December, 1922	201	560,159	198	564,367
November	138	374,871	139	374,871
October	164	417,901	148	406,498
September	159	375,340	159	382,079

Soo Canal Report

Freight movement through the Soo canals in September was heavy. The iron ore tonnage dropped below the 10,000,000-ton mark of the two preceding months but the total freight movement of 12,776,048 net tons is the second highest since 1917. The following table shows totals for the past seven years:

	Net tons
September, 1923	12,776,048
September, 1922	10,986,056
September, 1921	6,482,071
September, 1920	11,748,131
September, 1919	10,202,917
September, 1918	12,400,073
September, 1917	13,544,686

The American canals handled 12,482,468 tons of last month's total, leaving 293,580 tons to the credit of the Canadian canal. The following table shows the 1923 commerce through the Soo canal, divided by commodities, up to Sept. 1:

EASTBOUND

Lumber, M. feet B. M.	161,310
Flour, barrels	6,196,150
Wheat, bushels	110,436,996

Grain, bushels	46,241,238
Copper, net tons	39,078
Iron ore, net tons	45,350,788
Pig iron, net tons	14,576
Stone, net tons	17,600
General merchandise, net tons	33,592
Passengers, number	27,650

Salt, net tons	53,754
Oil, net tons	137,006
Stone, net tons	514,421
General merchandise, net tons	383,689
Passengers, number	27,589

SUMMARY

Vessel passages, number	15,572
Registered tonnage, net	49,253,672
Freight:	
Eastbound, net tons	50,776,789
Westbound, net tons	15,136,409
Total freight, net tons	65,913,198

WESTBOUND

Coal, soft, net tons	12,646,372
Coal, hard, net tons	1,197,706
Iron ore, net tons	144,655
Manufactured iron and steel, net tons	58,806

Record of Traffic Through Panama Canal

		Atlantic to Pacific traffic—Panama Canal			Pacific to Atlantic traffic—Panama Canal			Total traffic through canal—Panama Canal		
		No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo
1923										
August	American	157	825,056	435,851	127	670,023	1,071,457	284	1,495,079	1,507,308
	Foreign	104	445,708	302,749	66	291,803	358,693	170	737,511	661,442
	Totals	261	1,270,764	738,600	193	961,826	1,430,150	454	2,232,590	2,168,750
July	American	146	743,072	361,335	139	751,940	1,194,357	285	1,495,012	1,555,692
	Foreign	109	464,386	328,697	80	350,629	453,395	189	815,015	782,092
	Totals	255	1,207,458	690,032	219	1,102,569	1,647,752	474	2,310,027	2,337,784
June	American	131	705,481	385,843	115	607,950	1,022,421	246	1,313,431	1,408,264
	Foreign	96	405,816	270,146	75	316,655	418,036	171	722,471	688,182
	Totals	227	1,111,297	655,989	190	924,605	1,440,457	427	2,035,902	2,096,446
May	American	133	715,061	406,699	120	651,504	1,096,175	253	1,366,565	1,502,874
	Foreign	96	424,600	335,652	70	337,249	426,557	166	761,849	762,209
	Totals	229	1,139,661	742,351	190	988,753	1,522,732	419	2,128,414	2,265,083
April	American	123	662,300	331,114	116	637,178	1,041,481	239	1,299,478	1,372,595
	Foreign	81	360,318	322,255	84	347,894	492,295	165	708,212	814,550
	Totals	204	1,022,618	653,369	200	985,072	1,533,776	404	2,007,690	2,187,145
March	American	119	635,992	348,598	96	509,443	819,204	215	1,145,435	1,167,802
	Foreign	114	505,290	329,890	80	337,467	443,236	194	842,757	773,126
	Totals	233	1,141,282	678,488	176	846,910	1,262,440	409	1,988,192	1,940,928
February	American	97	486,186	325,835	82	422,871	633,458	179	908,673	959,293
	Foreign	78	354,190	237,604	69	266,300	366,381	147	620,874	603,985
	Total	175	840,376	563,439	151	689,171	999,839	326	1,529,547	1,563,276
January	American	88	450,254	313,094	67	320,300	462,245	155	770,554	775,339
	Foreign	106	473,524	285,649	91	366,614	530,944	197	840,138	816,593
	Total	194	923,778	598,743	158	686,914	993,189	352	1,610,692	1,591,932
1922										
December	American	78	363,857	328,924	68	344,847	551,907	146	710,704	880,831
	Foreign	83	352,020	231,494	75	312,539	422,777	158	664,559	654,271
	Total	161	717,877	560,418	143	657,386	974,684	304	1,375,263	1,535,102
November	American	65	324,783	234,500	55	273,293	416,515	120	598,076	651,015
	Foreign	83	370,180	266,878	91	369,024	508,967	174	739,204	775,845
	Total	148	694,963	501,378	146	642,317	925,482	294	1,337,280	1,426,860
October	American	70	328,229	264,171	51	250,606	385,196	121	578,835	649,367
	Foreign	89	384,223	300,904	84	347,334	495,592	173	731,557	796,496
	Total	159	712,452	565,075	135	597,940	880,788	294	1,310,392	1,445,863
September	American	54	260,249	226,741	53	235,008	315,898	107	495,257	542,639
	Foreign	72	322,167	241,095	61	252,986	354,454	133	575,153	595,549
	Total	126	582,416	467,836	114	487,994	670,352	240	1,070,410	1,138,188
August	American	58	261,613	257,674	48	236,669	305,838	106	498,282	563,512
	Foreign	83	350,249	299,087	68	235,602	303,351	151	585,851	602,438
	Total	141	611,862	556,761	116	472,271	609,189	257	1,084,133	1,165,950

Vessels in Ballast

1923										
August	American	82	477,284	0	2	6,073	0	84	483,357	0
	Foreign	24	100,910	0	3	9,581	0	27	110,491	0
	Totals	106	578,194	0	5	15,654	0	111	593,848	0
July	American	76	443,654	0	4	12,848	0	80	456,502	0
	Foreign	25	107,103	0	3	9,580	0	28	116,683	0
	Totals	101	550,757	0	7	22,428	0	108	573,185	0
June	American	70	422,173	9	0	0	0	70	422,173	9
	Foreign	27	118,540	0	2	7,255	0	29	125,795	0
	Totals	97	540,713	9	2	7,255	0	99	547,968	9
May	American	72	422,947	0	3	10,658	0	75	433,605	0
	Foreign	23	87,784	0	2	4,750	0	25	92,534	0
	Totals	95	510,731	0	5	15,408	0	100	526,139	0
April	American	67	393,895	0	3	18,837	0	70	412,735	0
	Foreign	11	44,214	0	2	9,412	0	13	53,626	0
	Totals	78	438,109	0	5	28,249	0	83	466,361	0
March	American	60	359,006	0	4	7,841	0	64	366,847	0
	Foreign	35	144,223	0	3	9,915	0	38	154,138	0
	Totals	95	503,229	0	7	17,756	0	102	520,985	0
February	American	36	229,578	0	0	0	0	36	229,578	0
	Foreign	24	105,848	0	3	7,486	0	27	113,334	0
	Total	60	335,426	0	3	7,486	0	63	342,912	0
January	American	29	181,617	0	2	10,141	0	31	191,758	0
	Foreign	26	109,586	0	1	4,942	0	27	114,528	0
	Total	55	291,203	0	3	15,083	0	58	306,286	0

Leviathan Now in Charge of U. S. Lines

The LEVIATHAN sailed from New York on Sept. 8 on her fourth voyage to Europe. She is maintaining her schedule with regularity and her performance indicates satisfactory operation of the entire machinery plant. Her super-ficial upkeep such as painting of hull and superstructure, cleanliness of decks and staterooms, is thoroughly main-

tained and is a distinct credit to her officers, crew and operators. On a ship of the immense size of the LEVIATHAN these details involve considerable labor and expense.

By the terms of the contract of the shipping board with W. F. Gibbs & Bro. Inc., this firm had charge of the LEVIATHAN during her initial period of operation, the United States lines attending to the business of securing and embarking passengers and loading and

discharging cargo. This initial period is now ended and control of the operation has passed to the United States lines. W. L. Bunker, superintending engineer of the United States lines, will from now on be immediately responsible for the successful operation of the machinery of the LEVIATHAN. Mr. Bunker sailed on the LEVIATHAN on her last two trips in order thoroughly to familiarize himself with the details of her machinery and various operation duties.

Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties—
A Record of Collisions, Wrecks, Fires and Losses

NAME	DATE	NATURE	PLACE	DAMAGE RESULTING	NAME	DATE	NATURE	PLACE	DAMAGE RESULTING
Active	Sept. 13	Collision	New York	Damaged	Harry R. Conners	Oct. 5	Fire	Brooklyn, N. Y.	Slight
Annie	Sept. 15	Fire	Philadelphia	Total loss	H. W. Bayler	Oct. 7	Fire	Brooklyn, N. Y.	Considerable
Amelia	Sept. 25	Grounded	Nuevitas	Undamaged	James E. C. burn	Sept. 19	Disabled	Charleston	Leaking
Allagash	Oct. 2	Disabled	Jacksonville	Broken cir. pump	J. M. Schoonmaker	Sept. 23	Collision	below Port Huron	Considerable
Alice L. Pendleton	Sept. 10	Struck rocks	Cuttyhunk	Not stated	J. E. O'Neill	Sept. 26	Grounded	Cherry Island	Floated
Atna	Oct. 8	Disabled	Hakodadi	Engines dis.	John S. Emery	Oct. 4	Hurricane	W. of Bermuda	Abandoned
Bogota	Sept. 25	Disabled	Kingston	Lost prop.	James McAllister	Oct. 7	Fire	Brooklyn, N. Y.	Considerable
Bennington	Sept. 29	Collision	Detroit river	18 plates dam.	Kapriano	Oct. 4	Heavy weather	New York	Deck dam.
Berryton	Sept. 29	Collision	Detroit river	Stern dam.	Karachl Maru	Oct. 9	Disabled	at sea	Not stated
Blue Bird	Oct. 2	Disabled	Ceara	Lost sails	Lexington	Sept. 21	Fog, grounded	Narragansett Bay	Small hole in hull
Brazilia	Oct. 6	Disabled	off Terschelling	Rudder dam.	Limicana	Sept. 23	Disabled	St. Thomas	Dam. steerer
City of Rockland	Sept. 1	Ashore	Dix Island	Serious, to beams and frames	Lorna Doon	Sept. 23	Not stated	near Bonavista	Lost
Calcite	Sept. 20	Grounded	Lake Erie	Floated	Liberta	Oct. 4	Disabled	Cadiz	Machy. dam.
City of Athens	Sept. 16	Disabled	Malta	Engine dis.	Malta Maru	Sept. 11	Collision	off Pensacola	Stem broken
Clement Smith	Sept. 21	Struck bridge	Fall River	Not stated	Mercier	Sept. 26	Disabled	Flushing	Defective machy.
Columbus	Sept. 25	Heavy sea	Kingston	Bowsprit & mast gone	Mary H.	Oct. 1	Disabled	off Kelleys Island	Intm. shaft broke
Christian Michelsen	Sept. 14	Fire	Rio Janeiro	No. 2 hold	Malietoa	Oct. 4	Collision	West Neebish cut	6 plates dam.
Colonel	Sept. 28	Grounded	Southeast Shoal	Undamaged	Moorfowl	Sept. 30	Fog, struck rock	off Ballycotton	Serious
Carrier	Oct. 1	In tow	Evanston	Sunk	Munrio	Sept. 24	Collision	San Francisco	Plates dam.
Cuba	Oct. 17	Ashore	off San Miguel Island	Abandoned, total loss	Melbourn P. Smith	Oct. 2	Storm, leak.	at sea	Abandoned
Cedric	Sept. 30	Fog, col.	off Ireland	Slight	Manoa	Sept. 23	Fire	St. Johns	To officers quarters
Comet	Sept. 27	Disabled	Beaumont	Boil. trouble	Muroch	Oct. 2	Stranded	Vainquer Island	Not stated
Cape Town Maru	Oct. 5	Heavy sea	at sea	To cargo	Mars	Oct. 4	Ashore	South Channel	Leaking
Commonwealth	Sept. 22	Collision	Boston harbor	Not stated	Montana	Oct. 5	Collision	off Umatilla Reef	Slight
Cabrille	Sept. 25	Disabled	Gulf of Mexico	Lost prop. blade	Medina	Oct. 1	Waterlogged	at sea	Abandoned
Chautauqua	Oct. 8	Heavy sea	Port Hawkesbury	Lost sails, leak	Norlina	Sept. 27	Fire	New York	Slight
Cicerone	Oct. 8	Disabled	Marseilles	Rudder gone	North Lake	Sept. 16	Disabled	off California coast	Eng. trouble
Cape Blomidon	Oct. 3	Grounded	Grants Point	Not stated	New Hampshire	Oct. 3	Grounded	E. of Huron Island	Jettis. cargo
Dicto	Sept. 7	Grounded	Marshfield	Undamaged	Oxelsund	Aug. 29	Not stated	Cape Breton	Lost
Daisy	Sept. 15	Grounded	nr Fort Point	Floated	Pelotas	Sept. 14	Collision	off Kaighns Point	To bow plates
Diana Dollar	Oct. 1	Fire & explos.	off lower Calif.	To No. 6 hold	Providence	Sept. 21	Ashore	Vera Cruz	Leak. badly
Delfina	Oct. 6	Disabled	Jacksonville	Condenser trouble	Percival Roberts	Sept. 28	Turned turtle	Lake Erie	On bottom
E. H. Utley	Sept. 25	Fog, col.	Detroit River	Slight	Richmond	Oct. 3	Hit obstruc.	Lake Huron	To wheel
El Oso	Sept. 23	Prop. struck wall	nr London	Not stated	Rochester	Sept. 29	Ashore	Vancouver island	Slight to forepeak
Eagle	Sept. 24	Grounded	San Diego harbor	Undamaged	Steel Seafarer	Oct. 1	Ashore	near Lewes	Undamaged
Electric Flash	Oct. 2	Ashore	Renewo	May be total wreck	Samuel Mitchell	Sept. 12	Collision	off Point Arguello	Considerable
E. C. Adams	Oct. 8	Ashore	Northumberland Strait Coast	Jettis. cargo	Seythia	Oct. 6	Struck dock	Cleveland	Undamaged
Frednes	Sept. 14	Collision	off Kaighns Point	To stern plates	Santa Teresa	Sept. 30	Fog, col.	off Ireland	Slight
Fram	Sept. 22	Fire	at sea	To eng. room	San Antonio	Sept. 27	Disabled	Payta	Steerer broke
Fueloil	Sept. 26	Struck obst.	New Orleans	Broke prop.	South American	Sept. 24	Collision	San Francisco	Not stated
Flora & Agnes	Sept. 29	Not stated	near Cove Point	Sunk	Tanamo	Sept. 26	Cargo shifted	Savannah	Not stated
Frances E. Moulton	Oct. 4	Grounded	New York	Floated	Texas	Sept. 13	Collision	New York	Slight
Giuseppe Verdi	Sept. 17	Fire	New York	To cargo	Tallapoosa	Sept. 12	Collision	off Point Arguello	Undamaged
Gerberville	Sept. 17	Dragged anc.	off George's Island	Not stated	Transport	Sept. 11	Collision	off Pensacola	Not stated
Gulf State	Sept. 23	Disabled	Cristobal	Cyl. broken	Talbot	Sept. 12	Collision	Detroit River	Collision
Gothic Star	Sept. 25	Disabled	Falmouth	Machy. dam.	Terrier	Sept. 25	Fog	Boston	Not stated
Gutfield	Sept. 30	Struck rocks	Lands End	Leak. badly	Troutpool	Sept. 28	Fire	St. Pierre island	Not stated
Grangesberg	Oct. 1	Touched ground	near Lulea	Ballast tanks damaged	Tom Beattie	Oct. 1	Ashore	Portland, Me.	Leaking
Guildford D. Pendleton	Oct. 2	Disabled	New York	Lost sails	Texiot	Sept. 30	Disabled	English channel	Slight
Gulfrade	Oct. 1	Collision	off Girard Point	Undamaged	Union	Sept. 26	Grounded	Rio Grande do Sul	Not stated
Garonne	Oct. 4	Disabled	New York	Lost prop. blades	William Booth	Sept. 27	Sprang leak	Delaware Bay	Sunk
Gertrude	Oct. 3	Not stated	SE of Sandy Hook	Not stated	West Arrow	Sept. 14	Col. with bridge	New York	Considerable
Gov. Parr	Oct. 6	Waterlogged	at sea	Abandoned	Wytheville	Sept. 19	Collision	at sea	To plates & forepeak
Haverford	Sept. 19	Collision	at sea	Not stated	Wm. F. Herrin	Sept. 18	Disabled	at sea	Boil. tubes dam.
Haleakala	Sept. 21	Disabled	Honolulu	Prop. blades, stern post & rudder post gone	West Segovia	Sept. 23	Fire	San Francisco	Unknown
Harry Coulby	Sept. 23	Collision	below Port Huron	Considerable	Warner No. 18	Sept. 22	Disabled	Charleston	Not stated
Henry Phipps	Oct. 3	Grounded	Calcite	Undamaged	West Keene	Oct. 1	Collision	off Girard Point	Not stated
Helen Swanzy	Oct. 2	Burned to water edge	at sea	Abandoned	Yport	Oct. 6	Sunk	at sea	Cargo lost
					York Castle	Oct. 1	Ashore	Scattari Island, Cape Breton	Total loss
								East London	Considerable

To Prepare Revisions of Navigation Laws

Alfred Gilbert Smith, president of the American Steamship Owners' association, has completed the selection of a special committee of practical ship managers and operators to prepare a complete revision of the navigation laws and rules of the United States, including the La Follette seamen's act and the laws and rules of the steamboat inspection service. This committee from the Shipowners' association will seek the active co-operation of the department of commerce and the shipping board.

The committee includes Capt. Eugene E. O'Donnell, manager of the marine department of C. H. Sprague & Son, Boston, chairman; J. D. Tomlinson, vice president of the American-Hawaiian Steamship Co.; David T. Warden, man-

ager of the marine department of the Tide Water Oil Co.; A. J. McCarthy, manager of the American flag steamers of the International Mercantile Marine Co., and Robert F. Hand, assistant manager of the marine department of the Standard Oil Co., of New Jersey.

Captain O'Donnell, chairman of the committee, besides being an operator of ships in the overseas and coastwise trade, has been a master of passenger and cargo steamers, and for several years was the supervising inspector of the steamboat inspection service at Boston. The other members of the committee have had large experience in the actual operation of important fleets under the American flag. Captain O'Donnell, Mr. Warden and Mr. Hand were among those who participated in the inquiry of the special committee created several years ago by the shipping board to

make a study of the navigation laws and rules. This former committee included representatives of the seagoing officers and men, and was headed by P. A. S. Franklin, president of the International Mercantile Marine Co. Its work will be a foundation for the present inquiry. The purpose is to have definite recommendations ready in time for consideration at the coming session of congress.

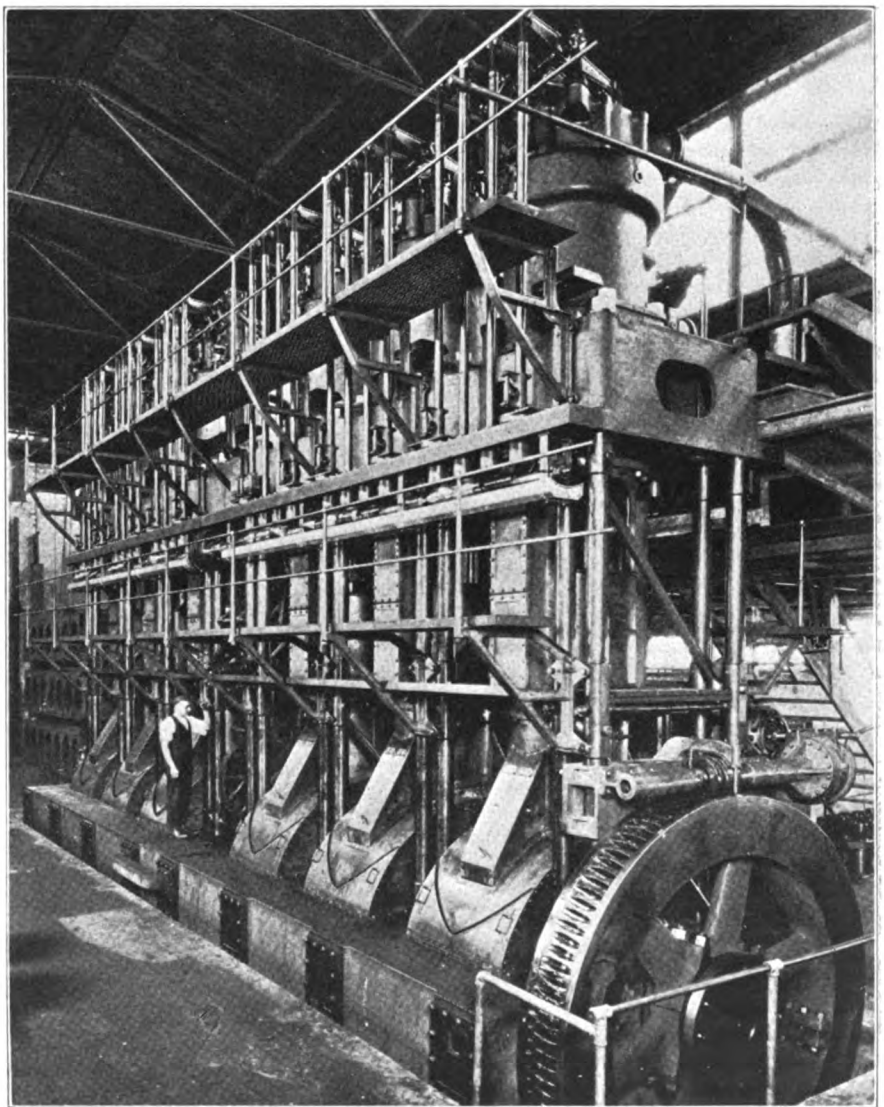
Sidney McLouth, prominent as a shipbuilder, recently died in a hospital at Detroit. He was 62 years old. For many years Mr. McLouth was active in business and political circles of Marine City, Mich. He formerly was connected with the Michigan Salt Co. and later engaged in boat building and ship construction. Later he operated a fleet from Marine City.

Convert American Freighter to Diesel

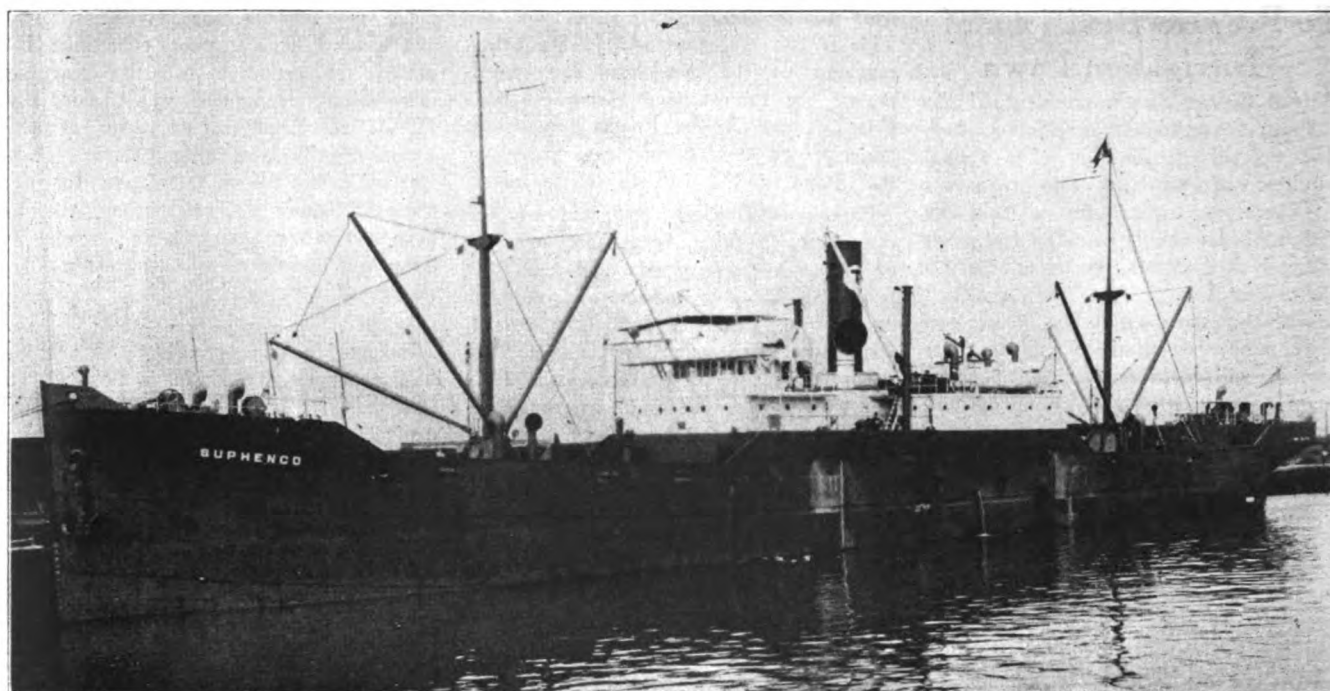
ON THE completion of the Emergency Fleet shipbuilding program, through arrangements with the government, the Transmarine Lines acquired the final 32 ships built at the Submarine Boat Corp.'s plant, Port Newark, N. J. The company is now successfully operating freight services from Port Newark to the gulf and to the Pacific coast. All of these ships are, of course, exactly alike, of 5300 tons deadweight and with turbines and reduction gears.

Some time ago, the Transmarine Lines decided to convert one of these ships into a motorship. This work was done at the Submarine Boat Corp.'s plant at Port Newark. On Oct. 9, the motorship SUPHENCO, shown in the accompanying illustration, arrived at Port Newark completing her maiden voyage after an excellent performance. The SUPHENCO in her first trip in the freight service of the Transmarine Lines made calls at the gulf cities of Pensacola and Port Arthur, returning to Port Newark. On this voyage of more than 5000 nautical miles, ample opportunity was afforded to show the merits of her new diesel engine installation.

According to reports received from her owners, she averaged more than 10 knots in speed, on a consumption of $4\frac{1}{2}$ tons of fuel oil per day. As the average lowest consumption of fuel oil per day for this type of ship with their regular motive power of steam turbine, is about 19 tons per day, the enormous saving in fuel over the steam drive is at once apparent. Enough fuel oil may be carried in the same tankage on the SUPHENCO as that used on the oil burn-



1800-HORSEPOWER DIESEL ENGINE WHICH WAS INSTALLED IN SUBMARINE BOAT TYPE FREIGHTER



MOTORSHIP OF SUBMARINE BOAT TYPE, 5300 DEADWEIGHT TONS, NOW CONVERTED TO DIESEL TYPE USING AN 1800-HORSEPOWER UNIT. SHE HAS COMPLETED HER FIRST TRIP

ing steamers to give her a cruising radius of 38,000 miles.

The diesel engine in the SUPHENCO illustrated by the accompanying photograph, was built by the James Craig Engine Works, Jersey City, N. J. It is a 6-cylinder, 4-cycle, crosshead diesel type, having a 30-inch bore and 48-inch stroke and operates at a maximum of 100 revolutions per minute. The main bearings, crankshaft, and pistons are water cooled. One of the desirable features of the engine is the elimination of the customary air compressor attached to the main crankshaft. An auxiliary unit compressor supplies the fuel air injection and has been found on the past voyage to be of ample capacity to furnish compressed air at all times even under severe conditions of maneuvering ahead and astern. In fact, maneuvering in this manner was so readily accomplished at the ports of call, that the services of a tug were dispensed with in handling the ship in and out of the loading berths. A complete conversion from steam has been made in the case of the SUPHENCO, as all deck machinery, winches, windlass, steering gear, and engine room pumps and auxiliaries are operated by electricity using specially designed marine motors, built by the Electro Dynamic Co., Bayonne, N. J.

It is distinctly apparent from such indications as the conversion of this ship from steam to a diesel drive, that American shipowners are gradually awakening to the economic possibilities of the diesel engine. Two major considerations at the present time stand in the way of

a widespread activity along this line: first, the high initial cost of making such a conversion and, second, the more or less untried and unproved permanently satisfactory operation of the diesel engines offered. With shipowners, the question always arises even after a short period of successful operation, whether this type of engine will give day in and day out, year in and year out good service without expensive and elaborate repairs which would have the tendency to eat up the savings made in fuel consumption.

This much may be said, however, that several of the European nations of long shipping experience have very actively gone into the building of diesel engine ships, apparently feeling secure that they will give good service without undue expense over as long a period as any other motive power.

Pacific Idle Fleet Is Smaller

In late September, only 24 shipping board vessels were laid up at Pacific coast ports compared with 70 at the corresponding period a year ago. The Japanese relief shipments brought out some additional ships earlier in September taking the total down to 24, with 12 at Benecia, Cal., 11 at Lake Union, Wash., and 1 at Portland, Oreg. The San Francisco laid-up fleet includes the freighters DIABLO, HAVILAH, HEBER, HAYNIE, FORT WAYNE, WESTBORO, MOHINKIS, WEST HARTS, WEST ELCAJON, and PANSA and the concrete tankers PERALTA and PALO ALTO.

Pacific Freight Market Is Strong

The freight situation in the North Pacific is considered remarkably strong. The disaster in Japan is expected to result in an unprecedented movement of food, building materials and other cargo to the Far East and freights are already showing a tendency to advance. Japan is not yet in position to place new business but as soon as that country has had time to take stock and arrange finances, an active buying movement will be under way. This is reflected in the freight market. Following the catastrophe of Sept. 1, a majority of transpacific lines suspended freight quotations because of the uncertainty of the immediate future and the requirements for relief supplies. New business was not accepted as a rule except at rates higher than conference.

While the conference rates on lumber are \$11.50 and \$13.50, shippers have been paying from 50 cents to \$1 above this level. Temporarily, Japanese government tramp tonnage was withdrawn from this market because it was thought the Japanese government might commandeer vessels to meet the situation. Norwegian owners are active in the North Pacific, offering their freighters on time charters ranging from 95 cents to 5 shillings depending on delivery and other conditions. Norwegian steamers have found much business in transpacific routes, many of them being taken for periods ranging from 6 to 12 months.

The European berth continues sadly depressed. Grain rates for parcel ship-

ments average from 20 to 25 shillings, which level is about 15 shillings below rates paid for full cargo steamers fixed early in the summer. Lack of buying in Europe is given as the reason for the lack of interest in wheat exports. However, apples, fish and other seasonal products are now moving so that the north Europe lines are handling an increased volume of business.

On the intercoastal route, a fair amount of general cargo is carried but lumber and copper are taking low rates, the conference having decided to leave rates on these commodities "open." Lumber is moving only in limited amount and the rate is weak at \$11. This berth appears to be over tonnaged in the meantime and under existing conditions there is no chance for tramp steamers to enter the coast to coast trade.

Southern California has resumed lumber buying on a heavy scale and freight rates are advancing in sympathy with the general situation. In the last 30 days, freights have been raised about 50 cents per thousand and are now quoted at \$7 and \$7.50. Operators on this route expect \$8 to be reached soon.

There is much disengaged sail tonnage at North Pacific ports. Competition of steamers and unattractive rates have made it impossible for owners of many sailing ships to operate at a profit.

Rules for Measuring Ships at Panama

Panama canal authorities have made a new interpretation of the rules for measuring vessels using the canal. In the January, 1923, issue of MARINE REVIEW, a complete analysis was made of the Panama canal rules. An original drawing was published showing the best method of cutting tonnage openings to obtain exemption of bridge and poop spaces. This method falls directly in line with the revised interpretations, which are as follows:

1. Your attention is invited to a recent amplifying interpretation by the commissioner of navigation of Article 25, Part 1, "Measurement of Vessels" (United States rules) which, though not retroactive, will be applied at once in deriving United States equivalent net tonnages as a factor for Panama canal tolls.

2. Referring specifically to the qualifications for exemptions from measurement of forecastles, bridges and poops through tonnage openings and their temporary closures, the ruling states "holes in, or attachments to, bulkhead (except angle stiffeners, channel bars, etc., on the inside or edges thereof for taking hook bolts, cross pieces and shifting boards) indicating permanent means of

closing tonnage openings, are not permitted."

3. Accordingly, exemptions from measurement under the United States rules will be disallowed on all vessels arriving for transit with (a) the presence of *holes* in the bulkhead plating; (b) the presence of *cleats* attached to the bulkhead plating; (c) stud bolts welded into, or bolts screwed through, the bulkhead plating; (d) hook bolts passing through bulkhead, or hinged doors when tonnage openings have been cut in latter.

4. Under a former ruling it should also be noted that the use of *both* plates, held in place by hook bolts grasping angular stiffeners at the sides of the openings, and shifting boards in channel bars are sufficient cause for disallowing exemptions.

5. All other specifications and regulations in Article 25, Part 1, "Measurement of Vessels," will be uniformly and impartially applied as heretofore.

A. W. HINDS,

Chairman, Board of Admeasurement.

Matson Plans to Build Fast Liner

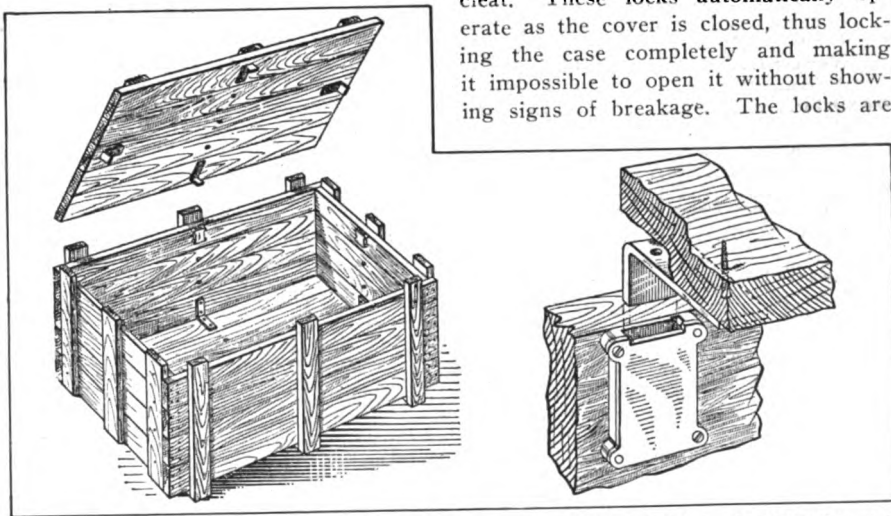
Plans are being worked out by the Matson Navigation Co., San Francisco, for a large, fast passenger liner for its

Pilfer-Proof Case for Valuable Freight

Requests made recently by the department of commerce for information on pilfer-proof cases, sealing and strapping systems and all antipilferage devices have brought to light a number of ingenious methods of outwitting the thief. The London chamber of commerce likewise has been receiving suggestions in response to its request, indicating a worldwide serious effort to combat the pilferage evil which has become a burden to ship operators, exporters and insurance companies.

Considerable information has been published in these columns recently on such cases. The design shown in the accompanying illustration was recently sent to the department of commerce. The box resembles a standard export case but one extra cleat, used as a seal, is provided around the center. Each intermediate board is fastened on the inside of the case to the center cleat by a screw, preventing such boards from being shifted or raised. Four angles screwed into the center cleat are fastened to the bottom of the case on the inside, as shown.

The top is secured by a device consisting of four automatic locks which are attached to the inside of the case, the screws extending into the center cleat. These locks automatically operate as the cover is closed, thus locking the case completely and making it impossible to open it without showing signs of breakage. The locks are



DETAILS OF PACKING CASE DESIGNED FOR PREVENTING PILFERAGE OF VALUABLE SHIPMENTS

Honolulu service. E. D. Tenney, president, has stated the company's expectation to build the liner, provided the cost is not too high. The tentative plan calls for a speed of 20 knots, accommodation for 500 first-class passengers and about 2500-ton freight capacity. The vessel would reduce the running time between San Francisco and Honolulu by one full day from the 5½ days now taken by the company's fastest vessels, MAUI and MATSONIA.

small enough not to interfere with the contents of the case. This case apparently is well adapted for valuable shipments, such as shoes, leather, textiles and silverware.

W. F. OHLSON, connected for 27 years with the International Mercantile Marine Co., and until recently assistant manager for the company in San Francisco, has been appointed manager of the new San Pedro, Cal., office.

World Ship Tonnage

Division of ship tonnage among the different nations on June 30 is given in the following table from Lloyd's Register. The ships included are of 100 gross tons and larger:

Country	No. ships	Gross tonnage
Argentina	199	178,465
Belgium	270	616,670
Brazil	382	478,630
British Empire—		
Great Britain and Ireland	8,694	19,281,549
Australia and New Zealand	641	769,589
Canada—Coast	827	960,225
Canada—Lakes	102	240,200

Hong Kong	99	258,388
India and Ceylon	212	230,883
Other Dominions	560	317,278
Chile	137	171,958
China	157	222,970
Cuba	64	50,423
Danzig	45	97,595
Denmark	780	996,862
Estonia	112	49,403
Finland	319	200,254
Fiume	21	42,446
France	2,021	3,737,244
Germany	1,843	2,590,073
Greece	405	755,441
Holland	1,114	2,625,741
Italy	1,415	3,033,742
Japan	2,003	3,604,147
Jugo-Slavia	121	120,954
Latvia	55	39,006
Norway	1,800	2,551,812
Peru	47	82,193
Portugal	284	1,260,206

Rumania	32	73,848
Spain	949	1,260,300
Sweden	1,385	1,207,727
United States—		
Sea	4,812	14,597,035
Northern Lakes	513	2,286,619
Philippine Islands	91	61,709
Uruguay	67	85,511
Other countries	795	755,598
Country not stated	134	232,135

Total 35,507 65,166,233

The Luckenbach Steamship Co. announces that due to improvement in the strike situation at the port of Los Angeles, all restrictions against shipments to that port are removed.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Oct. 11, 1923, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo	Finished steel	From North Pacific	Lumber
					cu. ft. 100 lbs.		Ports to	Per m. ft.
Liverpool	1s 6d	\$0.40	\$0.20	\$0.15	\$0.30 \$0.60	\$7.00T	San Francisco	\$6.00 to 7.00
London	1s 6d	0.40	0.20	0.15	0.30 0.60	7.00T	South California	6.50 to 7.50
Christiania	\$0.18	0.40	0.40	0.22	0.37½ 0.80	7.00T	Hawaiian Islands	10.00 to 10.50
Copenhagen	0.18	0.40	0.37½	0.25	0.42½ 0.85	7.00T	New Zealand	15.00 to 16.00
Hamburg	0.12	0.35	0.27½	0.17	0.37½ 0.75	8.00T	Sydney	15.00 to 16.00
Bremen	0.08	0.33	0.25	0.14 to 0.16	0.37½ 0.75	8.00T	Melbourne-Adelaide	15.00 to 17.00
Rotterdam	0.13	0.32½	0.25	0.17	0.35 0.70	7.00T	Oriental Ports	11.50 to 15.00
Antwerp	0.12	0.52½	0.25	0.18	0.35 0.70	7.00T	Oriental Ports (logs)	18.00 to 19.00
Havre	0.10 to 0.16	0.40	0.22½	0.23	0.40 0.75	8.00T	Peru-Chile	13.00 to 15.00
Bordeaux	0.10 to 0.16	0.40	0.22½	0.23	0.40 0.75	8.00T	South Africa	19.00 to 20.00
Barcelona	0.18	12.00T	0.40	10.00T	—12.00T—	10.00T	Cuba	13.00 to 16.00
Lisbon	0.20	0.65	0.40	7.00T	—20.00T—	7.00T	United Kingdom	80s to 90s
Marseilles	0.18	0.55	0.50	5.60T	—20.00T—	5.00T	United Kingdom (ties)	70s to 80s
Genoa	0.17½	0.50	0.35	0.30	0.40 0.80	6.00T	Baltimore-Boston range	\$11.00 to 12.00
Naples	0.17½	0.50	0.35	0.30	0.40 0.80	6.00T	Baltimore-Boston range	
Constantinople	0.23	15.00T	0.75	0.35	—20.00T—	8.00T	(ties)	Not quoted
Alexandria	0.25	15.00T	0.75	0.35	—20.00T—	8.00T	Buenos Aires	14.00
Algiers	0.20	0.75	0.75	0.30	—20.00T—	7.00T	Flour and Wheat	
Dakar		14.50T		13.00T	—20.00T—	10.00T	Oriental Ports (net ton)	\$ 6.00
Capetown	6.00T	12.00T	12.00T	9.00T	—12.00T—	9.00T	U. K. and Continent	
Buenos Aires		18.00 to 20.00T			18.00 to 20.00T†	6.00T†	(gross ton)	25s to 35s
Rio de Janeiro		19.00 to 21.00T		7.00 to 7.70T	19.00 to 21.00T†	6.00 to 6.60T†	General Merchandise	
Pernambuco		22.00T		9.00T	—22.00T—†	8.00T†	Oriental ports	\$9.00
Havana	0.17½ to 0.22½*	0.37½*		0.17½*	0.47* 0.94*	0.20*	Steel	
Vera Cruz	0.25	0.30	0.35	0.25	0.52½ 1.05	0.30	Oriental Ports	\$5.00T to 7.00T
Valparaiso		1.07		0.70	0.45 0.80	12.00T	Cotton	
San Francisco		0.40 to 0.70		0.70 to 1.00		2.50 0.45 to 1.25	Oriental Ports	35c to 50c per cwt
Sydney	18.00T	18.00T	2.50	18.00T	18.00-24.00	9.00-12.00T	Apples	
Calcutta		16.00T	0.65	15.00T	—16.00T—	10.00T	United Kingdom	90 cents per box
T—Ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfrage.							Copper	

Principal Rates To and From United Kingdom

	s	d		s	d
Grain, River Plate to United Kingdom	21	6	Coal, United Kingdom to Buenos Aires	13	6
Coal, South Wales to Near East	10	0	Iron ore, Bilbao to Middlesbrough	6	6
Coal, United Kingdom to Hamburg	5	9	General British market, six months time charters, per ton per month	6	0

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 13, 1922	\$8.55	\$1.45	5.50 cents
Jan. 11, 1923	7.90	1.50	4.75 cents
April 11	6.75@7.50	1.76½	5.10@5.35c
July 11	5.50@7.00	1.76½	4.40@5.50c
Sept. 10	5.50@7.00	1.66½	4.25@4.65c
Oct. 11	5.25@6.85	1.51½	4.00@4.50c

At Philadelphia

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 13, 1922	\$8.30	\$1.47	5.00 cents
Jan. 9, 1923	7.30@8.00	1.57½	5.00 cents
April 10	6.00@6.50	1.875	5.10 cents
July 9	5.25@6.25	1.62	@1.73 4.35@4.60c
Sept. 10	5.50@6.00	2.52½	@1.60 4.25@4.88c
Oct. 11	5.00@5.50	1.36½	@1.51 4.12@4.36c

Other Ports

Boston coal, per ton	\$8.12
Boston, oil, f. a. s., per barrel	\$1.45
Hampton Roads, coal, per ton t.i.b.	5.50@5.70
Cardiff, coal, per ton	26s
London, coal per ton	20s
Antwerp, coal, per ton	28s

Equipment Used Afloat, Ashore

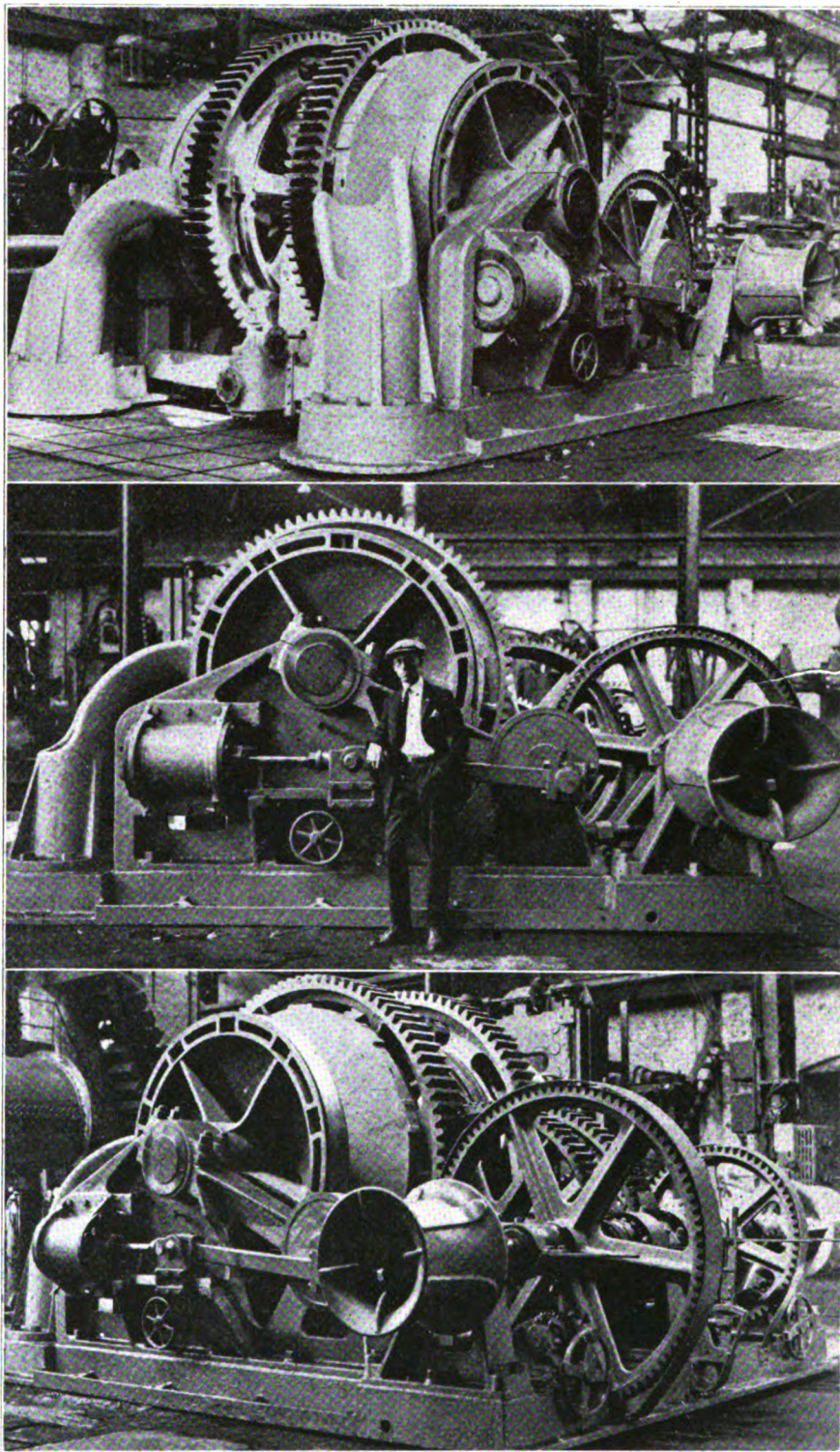
Huge Windlass—Rivet Forge—Electric Oven—Spot Welder

A STEAM windlass completed at the Willoughby, O., works of the Hadfield-Penfield Steel Co., is of interest because of several special features. It is to be installed on the U. S. submarine tender HOLLAND building at the Puget Sound navy yard, Bremerton, Wash. While it is intended to handle regular 2 $\frac{3}{4}$ -inch navy standard chain, it has considerably more power than would ordinarily be required for this size of chain. In addition to lifting the anchors, it is also intended to lift the tail of fleet submarines.

This submarine tender is to be used as a mother ship for the submarines of the navy and will be called upon to make such temporary repairs as may be required while the submarines are away from their base of supplies on long trips. The HOLLAND is the only submarine tender which the navy has constructed and she is large enough and is equipped with machinery of such size and power as to lift the tail of a fleet submarine sufficiently out of the water to replace a propeller wheel if necessary.

When specifications were drawn for the windlass for this tender, it was necessary to determine how much power would be required to lift the tail of a fleet submarine, and it was finally decided that it would require a pull of one million pounds. In order to get a windlass that would exert a direct pull of one million pounds, it was found that the windlass would be too large for use on the vessel. The designer of this windlass suggested to the navy department that the chain could be led from the wild cat out through the hawse pipe and around a large sheave and then the end of the chain made fast to the bow of the vessel. The sheave was to be fitted with a hook to which the chain, which was fastened to the submarine would be attached. By this arrangement the actual pull exerted by the windlass would be practically one-half of that required to lift the submarine, as the sheave would make a two to one purchase.

A windlass for 2 $\frac{3}{4}$ -inch chain generally exerts a pull on the chain of about 86,000 pounds when used only for handling the anchor, but it will be noted that this windlass must exert a pull on the two chains of something more than 500,000 pounds. This necessitated designing a special windlass

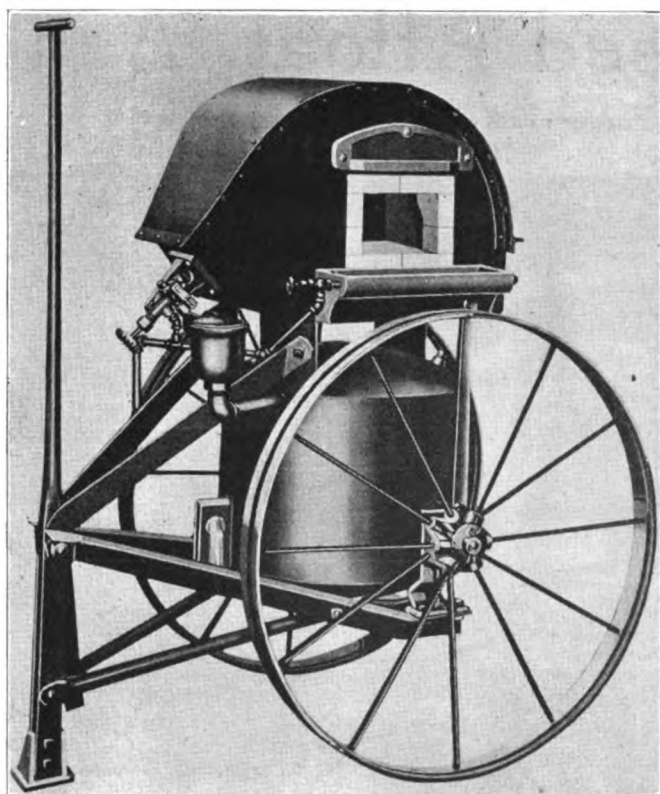


SPECIALLY DESIGNED WINDLASS FOR AIDING REPAIRS TO SUBMARINES AT SEA

having a ratio of gearing sufficient to produce the required pull.

The windlass has 13 x 13-inch double cylinders with cranks set at 90 degrees. The gearing is so arranged

that by operating through one set of gears the anchors can be hoisted at the usual rate of speed. By means of clutches this set of gearing can be thrown out of use and another



PORTABLE RIVET FORGE HAVING A SPECIALLY DESIGNED OIL BURNER

set brought into play which will give the required pull of 500,000 pounds at a very slow speed.

An idea of the size of this windlass can be obtained from the photograph showing the man standing alongside. The distance from the deck to the center of the wildcat shaft is 5 feet, while the height from the deck over the top of the main gears is 8 feet, 4 inches. The overall length fore and aft is 18 feet 1½ inches and the overall width is 16 feet, 9¾ inches. The net weight is 97,800 pounds.

The chain from the hawse pipe first passes under and then around and over the wildcat and down through the chain pipes, shown on the forward end of the windlass to the chain lockers below. This is contrary to the usual practice where the chain generally passes over the wildcat and down through the chain pipes directly under the wildcat.

This windlass was designed by the Hadfield-Penfield Steel Co. and was built in accordance with the navy department's specification for materials. All gearing has machine cut teeth.

Introduces Oil Burning Torches and Forges

A new line of oil burning industrial heating apparatus has been introduced by the Johnston Mfg. Co., Minneapolis. Among the articles being

placed on the market are rivet forges of the portable type designed especially for use in ship and car repair shops, structural shops and boiler shops, oil burning torches and pressure blowers.

A clear view of the rivet forge is shown in the accompanying illustration.

tion. Features of the rivet forge are the heavy framework, the heavy lining, large wheels, etc. A new type of oil burner is used on this series of forges, on which the burner operates continuously without readjustment of the oil feed and without variation in the flame, using a fuel oil containing a large quantity of free carbon. This is accomplished by eliminating restrictions in the oil passage and by regulating the oil feed by an air valve. The entire floor of the heating chamber is visible to the operator so that he does not have to stoop to see the work. The capacity of the forge is limited by the operator's speed in charging and delivering the rivets. Capacity of the tank is 20 gallons and the height of the hearth is 38 inches. A light forge is also included in this series for use in car repair yards where easy and quick portability are required.

Automatic Electric Bake Ovens for Marine Use

A new type of electric bake oven designed to promote economy, flexibility, and compactness and thus to be well adapted for marine service has recently been developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This new oven is constructed in sections, each of which is independent of other sections and is entirely automatic in its operation. These oven sections are built of heavy sheet steel reinforced with angle irons and are thoroughly insulated with a high-grade mineral-wool. A



BATTERY OF SECTIONAL TYPE BAKE OVENS FOR SHIP'S GALLEY. EACH OVEN — CONSISTS OF TWO 60-LOAF SECTIONS

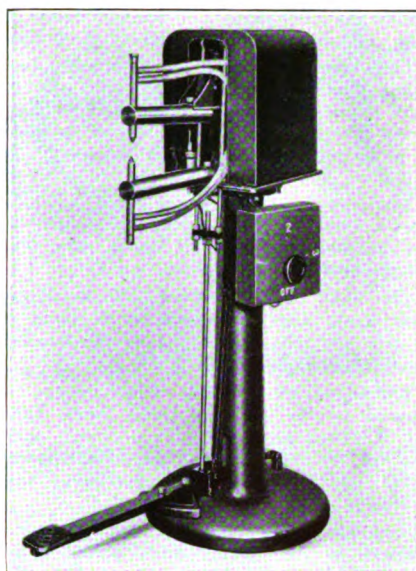
rigid enameled angle iron stand is used for mounting the oven. The sections are made in two standard sizes, one with a capacity of 20 and the other of 60 loaves.

Each section is equipped with motor operated snap switches, a thermometer and a thermostat for controlling the oven temperature. All electrical connections are made in a single terminal box requiring only one connection to the power service. The heating units, which are entirely enclosed, are mounted at the top and bottom of each section and are distributed so as to give a uniform temperature throughout the baking chamber. The top heaters are fastened to the bottom of a steel plate, upon which the hearth tiles are laid. The plate with the heaters can be removed from the oven like a rack, facilitating replacements when necessary.

The temperature control of these ovens is simple. An arm projecting through the metal control box at one end of each section adjusts the operating temperature. By moving this arm along a graduated scale, oven temperatures ranging from 300 to 500 degrees Fahr. can be obtained. When the temperature in the oven section gets too high, the thermostat, operating through the motor operated snap switch, shuts off the current automatically and turns it on again when the temperature has dropped. It is thus possible to keep the temperature within 10 degrees of the operating temperature without any attention whatever.

The advantages of the sectional type of construction, in conjunction with electric heat, are obvious. Because of the independence of the sections and the efficiency of the insulation between them, different temperatures can be maintained in each section and a number of products, limited only by the number of sections in the installation, can be baked at one time. A new section can be added to the installation at any time if the need arises.

Many advantages have been claimed for electric galley equipment. Three



SPOT WELDING MACHINE USES ALTERNATING CURRENT

distinct sources of saving are emphasized in the use of electric heat for baking. These are a saving of labor because of the automatic and accurate control; a saving in heat because of the efficient insulation and the fact that no ventilation is needed in an electric oven, and a saving in material through less shrinkage of the product and its better keeping qualities.

Other advantages, particularly important from the point of view of the ship operator, are the cleanliness of this type of oven, the small amount of floor space required, and the slight heat radiation. The absence of fire and explosion hazard is also of importance.

Designs Electric Spot Welding Machine

An electric spot welding machine designed primarily for operation on alternating current but which also is adaptable, by means of a special device, to the use of direct current, recently has been developed by the H. J. Ness Mfg. Co., 305 Broadway, New York. One

of the features of this machine, which is shown in the accompanying illustration, is that the transformer is located within two inches of the rear ends of both horns and midway between them thereby decreasing the losses, it is claimed. The electrodes also are heated uniformly since the lead to each is about the same length. Tests have shown that from No. 30 wire to a 1/2-inch rod may be welded on the standard machine with a 10-ampere fuse in the line, indicating that the current consumption does not exceed 10 amperes.

Another feature of the equipment is an oil dashpot switch which is said practically to eliminate sparking at the switch points and thus lessen the deterioration of these points. The equipment also is made sensitive by the reduction of the lag between the switch and the electrodes. The upper horn is carried by a rocking arm and is lowered to the work by depressing the foot pedal. The upper electrode comes in contact with the work under spring pressure, the spring being further depressed until the current is turned on. The work is brought immediately to the welding temperature, and the current then automatically turned off. The weld is completed under a spring pressure that is adjustable to suit conditions.

Three welding steps for each voltage are obtained, by means of a selector switch, to suit the different thickness of material handled. A voltage of 110 or 220 may be supplied the machine and more steps are optional. There are seven adjustments to the machine for regulating the height between the horns, the pressure applied to the electrodes in welding, etc. The treadle position may be shifted 35 degrees to suit the convenience of the operator. The horns consist of copper bars, which are adjustable and water cooled. The electrodes are secured to the horn by means of a hand operated lever and a cam lock.

Business News for the Marine Trade

Contract for converting the steamer ADMIRAL GOODRICH to adapt her for the lumber trade has been let to the Bethlehem Shipbuilding Corp., the work to be done at the Union plant, San Francisco. The ship is the property of the National Steamship Co.

Shipyards property of the H. E. Crook Co., near the Port Covington terminals of the Western Maryland railways has been purchased by the city of Baltimore. The property will give

the city space for six piers. Additional land will be bought to provide a site for the eight piers called for in the plans of the port development commission.

Liquidation has been begun by the Union Construction Co., Oakland, Cal. The Union yards were built at a cost of about \$2,500,000. Liquidation is expected to be completed within six months.

Contract for reconditioning the United States

shipping board cargo carrier LIBERTY LAND was let to the General Engineering Corp., San Francisco, on a bid of \$14,110.

Articles of incorporation are pending for the organization of a new steamship line to the Orient with headquarters in Los Angeles. Negotiations are said to be in progress for the purchase of three ships from the United States shipping board. Two of these are said to be 10,000 tons deadweight for freight use only.

and the third will be 21,000 tons deadweight for combination passenger and freight service.

The Electric Fan Motor Service Corp., 200 West Monroe street, Chicago, has been incorporated to manufacture electric fans, blowers and motors, by J. E. Hartley, P. K. Williamson and E. I. Shelburne.

To manufacture and deal in motor, air current and ventilating fans, and products, the Hi-Lo Products Co., Monadnock block, Chicago, has been incorporated for \$100,000.

Carnegie Steel Co. has authorized the expenditure of \$1,800,000 for erecting coke receiving docks on the Ohio river at Mingo, O., for its Mingo plant. The docks will be 1500 feet long and will be equipped with all modern machinery for quickly unloading coke.

The port of Tacoma, Wash., has authorized extensions to double the capacity of the piers of the port, which are now able to store 15,000,000 feet of lumber.

Contract for \$400,000 has been let by the United States shipping board to Edward Fay & Son, for alterations to piers at Oregon avenue and Delaware street, Philadelphia.

To manufacture pistons, piston rings, pins and bushings for all kinds of stationary and marine engines the Stalker Engineering Co., Ltd., Simcoe, Ont., has been incorporated to purchase and carry on the business formerly conducted by J. M. Stalker, that city.

Negotiations are nearing completion whereby the Sun Shipbuilding & Drydock Co., Chester, Pa., will take over from the government a 10,000-ton dry dock now located at New York.

The Philadelphia Derrick & Salvage Co., Dover, Del., was incorporated for \$100,000, by Clinton E. Rowe, Whitestone, N. Y.; Charles P. Kramer, Far Rockaway, N. Y., and Joseph Lilly, Brooklyn, N. Y.

The Silverado Steamship Co. has been incorporated at San Francisco with a capital stock of \$86,000 by Charles R. McCormick, of Charles R. McCormick & Co., Fife building; James S. Brown, John H. Hencken, Charles L. Wheeler and E. B. De Golia. The company plans to enter a steamer in the coastwise trade for general cargo.

The McCormick Steamship Co. and Charles R. McCormick & Co. have moved their offices from the Fife building to the new Matson building, 215 Market street, San Francisco.

The Standard Transportation Co., subsidiary of the Standard Oil Co. of New York, came into the market recently for from three to six oil barges.

Public Service Shipping Corp., Wilmington, Del., was incorporated for \$1,000,000, to own and operate boats.

Ralph G. Magee, Magee Bros., Ltd., Philadelphia, purchased the British schooner *MONCLAIR* at a United States marshal's sale in Camden, N. J. The ship, out of commission for the past year, will be refitted and sent to sea. She has about 700 tons carrying capacity.

Estimates were submitted to the board of state harbor commissioners, San Francisco, recently for building 1300 feet of seawall and 2½ acres of piers and reclaiming 21½ acres of land at Islais creek. The work is estimated to cost \$1,000,000.

The Maritime Scaling Co. has recently opened offices at 172 Condor street, East Boston, Mass., and is engaged in general ship cleaning, scaling and painting, including boiler scaling, etc.

The Canadian Dredging Co., Midland, Ont., has been awarded the contract for building 2000 feet of breakwater at the south end of Port Arthur harbor. It is expected that four years will be required to complete the work.

O. J. Klein Transportation Co., Ltd., Campbellton, N. B., Canada, has been incorporated to build and operate ships and vessels with

\$50,000 capital by Robert V. Sinclair, Archie F. May, Richard J. Sims and others of Ottawa.

The Intercoastal Lumber Terminals, Inc., Grand Central terminal, New York, will require machinery, cranes, hoisting machines, etc., for its proposed terminal and distributing plant on a site recently purchased on Newark, N. J., bay.

Establishment of a branch plant at Lake Harris, Leesburg, Fla., is being contemplated by the Riftclimber Boat Co., Mount Alto, Pa., manufacturer of power boats, etc.

The Todd Shipyard Corp., 25 Broadway, New York, plans extensions to its plant at its new site recently leased from the shipping board at Weehawken, N. J.

Extensions of its ship repair works is planned by the Alderton Dock Yards, Ltd., 516 Hamilton avenue, Brooklyn, N. Y., operator of a shipbuilding plant. It recently leased the drydock of the government now at Newport, R. I.

California Marine Transport Co., with headquarters in the Hollingsworth building, Los Angeles, plans a passenger line to Ensenada, Mex. Three ships are expected to be put into service between the Los Angeles harbor and the Mexican port, each capable of carrying 225 passengers and 200 tons of freight. The company is capitalized at \$500,000. The directors are T. A. Thompson, president; R. K. Snow, secretary and treasurer; Donald B. Barker, counselor, and M. H. Watson and Charles Lloyd.

Hanlon Drydock & Shipbuilding Co. has the contract for reconditioning the steamer *MERIDEN* on a \$45,424 bid. The ship was purchased recently by E. K. Wood Lumber Co. from the General Steamship Corp.

Hoops-Woods Shipyard Co. was incorporated at Albany, N. Y., for \$10,000 to build a shipyard at Rockaway Beach, L. I. Incorporators are W. Hoops, W. H. and H. P. Woods and Denenholz & Pike.

New Trade Publications

TRAVELING GRATE STOKER—The Combustion Engineering Corp., New York, recently has published an 8-page illustrated pamphlet describing briefly the history, construction, and operation of the traveling grate stoker. A table giving operating data is included.

FORCE FEED OILERS—A 20-page illustrated catalog issued by the Detroit Lubricator Co., Detroit, points out the advantages of forced feed lubrication. The booklet describes in particular a new valveless model with a sight feed, which is operated automatically.

FUEL TESTING—The value of accurate testing of fuel is emphasized in a circular published by the Pittsburgh Testing Laboratory, Pittsburgh. The proper method of preparing a sample of coal or coke by hand is told in a comprehensible manner by means of illustrations and accompanying directions.

ELECTRIC HOISTS—The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., is circulating a 68-page illustrated catalog, which points out the many and varied uses of the electric hoist. Illustrations showing cranes in use in different industries and details of construction are included in the booklet.

HEAVY DUTY MOTORS—The Reliance Electric & Engineering Co., Cleveland, has published a 32-page illustrated catalog in which the various stages in the construction of a heavy-duty direct-current motor are described. Part assemblies, such as fields, armature, etc., are shown separately. Several diagrams are presented to illustrate the various

parts of the motor, and tables give ratings and dimensions.

MACHINERY—An 8-page folder listing various pieces of machinery, such as boring machines, shapers, lathes, etc., has been issued by the E. L. Essley Machinery Co., West Washington boulevard, Chicago.

ELECTRIC HOISTS—The Detroit Hoist & Machine Co., Detroit, has issued a 25-page catalog describing hoists, monorails, cranes and winches. Illustrations show the applications of these hoists to the various fields of industry.

CONTROLLER VALVE—Information regarding controller valves for air and oil, air and gas, and air, gas, water and steam, is included in a bulletin published recently by the Bristol Co., Waterbury, Conn. Descriptive matter concerning temperature controllers and recording pyrometers also is given.

LUBRICATING DEVICES—Sight feed, snap lever, slide and screw top oilers, and grease cups are illustrated in a folder issued recently by the Penberthy Injector Co., Detroit. Specifications and other descriptive matter are included.

FLEXIBLE COUPLINGS—Couplings which compensate for parallel misalignment are described in a pamphlet recently issued by the Thomas Flexible Coupling Co., Warren, Pa. Several reproductions of blueprints with diagrams of couplings and tabulated data are included.

AIR COMPRESSORS—The various parts of a straight line air compressor are illustrated and described in a bulletin by the Sullivan Machinery Co., Chicago. Lubrication, and construction details and table dimensions, indicated horsepower, etc., are included.

BOILER FEED REGULATORS—A 20-page catalog recently was issued by the Northern Equipment Co., Erie, Pa. It contains a description of a boiler feed regulator and several flow charts and illustrations of valves and regulators.

CASTINGS—Malleable castings are discussed in a bulletin recently published by the American Malleable Castings association, 1900 Euclid building, Cleveland. Physical properties, service and uses are pointed out.

AIR BRUSHES—A large illustrated folder in which air paint brushes and their applications are depicted, recently has been issued by the Paasche Air Brush Co., 1909 Diversey Parkway, Chicago. Various types of equipment are shown in use painting buildings, bridges, standpipes, boats and tanks.

ELECTRIC TRACTORS—The Mercury Mfg. Co., 4118 South Halstead street, Chicago, recently has issued a 6-page folder which illustrates the various features of an electric industrial tractor equipped with a new type of drive. Construction details are shown in the illustrations of subassemblies of the machine. Other illustrations show the tractors in actual service indicating their wide range of usefulness.

PNEUMATIC RIVETERS—An illustrated folder recently issued by the Hanna Engineering Works, Chicago, describes a hydraulic riveter which may have single, double, triple, or six pressure cylinders. A table lists the capacity in tons, and the diameters of the large, small and push-back cylinders.

LIGHT REFLECTORS—Several leaflets published by the National X-Ray Reflector Co., Chicago, show the advantages gained by intensifying illumination with the use of reflectors.

RECORDING INSTRUMENTS—The use of graphic recording instruments in boiler and generator rooms, substations, meter departments, etc., is explained in a bulletin issued by the Esterline-Angus Co., Indianapolis. Several illustrations of their applications are given.